

SONY®

SERVICE MANUAL

TABLE OF CONTENTS

<u>Section</u>	<u>Title</u>	<u>Page</u>	<u>Section</u>	<u>Title</u>	<u>Page</u>
1. TECHNICAL DESCRIPTION			3-3.	Level Check at Crossover Frequency	10
1-1.	Technical Specifications	1	3-4.	Bass Boost Check	11
1-2.	Detailed Circuit Analysis	1~4	3-5.	Crosstalk Measurement	11
1-3.	Block Diagram	4	3-6.	Noise Level Measurement	12
2. DISASSEMBLY AND REPLACEMENT PROCEDURES			3-7.	Harmonic-Distortion Measurement and Clipping-Point Adjustment	12~13
2-1.	Tools Required	5	3-8.	Channel Selector Switch Operational Check	14
2-2.	Hardware Identification Guide	5	4. PERFORMANCE CURVES		15~17
2-3.	Top Cover and Front Panel Removal	5	5. REPACKING		18
2-4.	Pilot Lamp Replacement	6	6. DIAGRAMS		
2-5.	Filter Amplifier Board Removal	6	6-1.	Schematic Diagram	19~20
2-6.	Control and Switch Replacement	6~7	6-2.	Mounting Diagram	21~24
2-7.	Rear Panel Removal	7~8	7. EXPLODED VIEW		25
2-8.	Replacement of Components Secured to The Rear Panel By Rivets	8	8. ELECTRICAL PARTS LIST		26~28
3. OVERALL CHECKS AND MEASUREMENTS			4-CHANNEL ADAPTOR TAD-43F		29~46
3-1.	Test Equipment Required	9			
3-2.	Level Check Within Passband	9			

SECTION 1

TECHNICAL DESCRIPTION

1-1. TECHNICAL SPECIFICATIONS

Technical specifications for the TA-4300F are given in Table 1-1.

TABLE 1-1. TECHNICAL SPECIFICATIONS

Frequency response :	10 Hz to 100 kHz ± 1 dB
Crossover frequency :	LOW : 150, 250, 400, 600, 800, 1000 Hz HIGH : 1.5k, 2.5k, 3.5k, 4.5k, 6k, 8k Hz
Input impedance :	90 k ohms
Output impedance :	Less than 5 k ohms
Harmonic distortion :	0.03% at 1 V output 0.1 % at 4 V output (at each frequency passband) 0.05% at 1 V output 0.1 % at 2.5 V output (at crossover frequency)
Signal-to-Noise Ratio :	85 dB shorted circuit (1 V input)
Maximum input signal :	4.5 V
Bass boost control :	0, 3, 6, 12, 18, dB at 20 Hz
Power consumption :	Approx. 5 watts
Power requirement :	100, 120, 220, or 240 volts ac
Dimensions :	200mm (width) X 149mm (height) X 316mm (depth) 7 ⁷ / ₈ " (width) X 5 ⁷ / ₈ " (height) X 12 ⁷ / ₁₆ " (depth)
Net weight :	3.8 kg (8 lb 6 oz)
Shipping weight :	5.5 kg (12 lb 2 oz)

1-2. DETAILED CIRCUIT ANALYSIS

The following describes the functions of all stages and controls. The text sequence follows signal paths. Stages are listed by transistor reference designation at left margin; major components are also listed in a similar manner. Refer to the block diagram on page 4 and schematic diagram on pages 19 and 20.

Stage/Control

Buffer amplifier
Q101, Q102

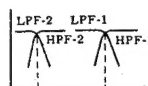
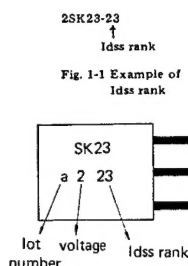
Function

Presents the input signal with a high input impedance and drives the following filters. Q101 and Q102 form a modified source follower circuit in which Q102 acts not only as constant-current source, but also as a drive amplifier for the negative-going half cycle.

This FET-PNP combination amplifier has the advantage of low harmonic distortion and wide dynamic range. In addition, the FET generates less noise than conventional silicon transistors. Therefore, this combination amplifier is employed in all of the filter circuits. The FETs used in this type of circuit are selected according to their I_{dss} rank, and care should be taken to use replacement FETs with the exact same I_{dss} rank.

I_{dss} rank is indicated by the identification number, as illustrated in Fig. 1-1.

Before studying the following circuit, note that the filter circuits consist of two pairs of high- and low-pass filters having variable crossover frequencies. The high crossover frequency (f_H) can be 1.5 kHz, 2.5 kHz, 3.5 kHz, 4.5 kHz, 6 kHz, or 8 kHz, and the low crossover frequency (f_L) can be 150 Hz, 250 Hz, 400 Hz, 600 Hz, 800 Hz, or 1 kHz, as shown in Fig. 1-2. By combining these filters, the TA-4300F provides various kinds of filter characteristics, such as two-channel or three-channel filtering having a crossover frequency of f_L or f_H , or both. See Fig. 1-2.





Stage/Control

Function

characteristic is changed according to S5's setting.

At the 2 CH LOW position of S5, the input is a full range signal. Only the high-frequency component having the crossover frequency of "fL" appear at the MID-RANGE output jack.

At the 2 CH HIGH position, no signal is supplied to this filter, therefore no signal appears at the MID-RANGE output jack. At the 3 CH or 4 CH positions, S5 supplies the LPF-1 output signal to this filter. Therefore, the overall frequency response obtained by combining the low and high-pass filters is that of a bandpass filter having a frequency characteristic between fL and fH as shown in Fig. 1-4.

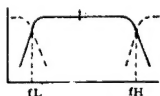
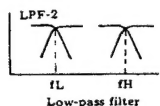


Fig. 1-4 Bandpass filter

Low-pass filter LPF-2



Low-pass filter

FET-FET buffer amplifier (Q501, Q502) and the RC network consisting of C501, C502, C503, C511 and the resistors connected to switch wafers S4-7, S4-9 and S4-11, comprise a lowpass filter having a crossover frequency of "fL" and a rolloff of about 18 dB/octave. Input signal is fed through the first buffer amplifier (Q101, Q102), and the output is routed to the low-boost amplifier through Channel Selector switch S5.

LOW CHANNEL FREQUENCY SHIFT control

Switches S1-1, S1-3 and S1-5 are paralleled across S4-7, S4-9 and S4-11 respectively, to change the rolloff frequency of low-pass filter LPF-2 slightly to match the characteristics of the low-frequency speaker.

Bass-boost ampli- fier Q503, Q504

This direct-coupled three-stage amplifier boosts the output signal of low-pass filter LPF-1 or LPF-2 to the level required at the LOW outputs.

Stage/Control

Function

This amplifier also controls the low-frequency characteristics by using frequency-selective negative feedback techniques. The resistances connected at S2 change the feedback voltage, thus controlling the low boost value from zero to +18 dB at 20 Hz. The low-boost frequency response is shown in Fig. 1-5.

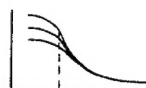


Fig. 1-5 Bass boost response

Negative feedback is provided from the emitter circuit of Q505 to the source of Q503 through BASS BOOST switch S2. Potentiometer R566 in the source circuit of Q503 determines the bias current in Q503. This in turn sets the bias current in Q504 and Q505, ensuring the distortionless boost operation at low frequencies. The output is fed to the LOW-FREQUENCY output jack through LEVEL control R517. It also supplied to the CENTER CHANNEL output jack through R508 or R608 for use in center-woofer systems. Note that the left and right channel low-frequency components are mixed at this jack.

CENTER CHANNEL Output jack J701

4 CH CONNECTOR

This socket is provided for connecting optional accessory TAD-43F, (4-channel adaptor). It delivers dc power and the high-pass filter's output to the TAD-43F.

Power Supply

Rectifier circuit

Line input is supplied to the transformer through POWER switch S6. The output from the power transformer is rectified by bridge rectifier D701 to produce about +42 volts dc.

SECTION 2

DISASSEMBLY AND REPLACEMENT PROCEDURES

WARNING

Unplug the ac power cord before starting any disassembly or replacement procedures.

2-1. TOOLS REQUIRED

The following tools and materials are required to perform disassembly and replacement procedures on the TA-4300F.

1. Screwdriver
2. Phillips head screwdriver
3. Soldering iron, 30 to 50 watts, equipped with solder sucker
4. Wrench
5. Long-nose pliers
6. Electric drill and drill bit
7. Solder, rosin core

2-2. HARDWARE IDENTIFICATION GUIDE

The following chart will help you to decipher the hardware codes given in the service manual.

Note: All screws in the TA-4300F are manufactured to the specifications of the International Organization for Standardization (ISO). This means that the new and old screws are not interchangeable. ISO screws have a different number of threads per mm compared to the old ones.

The ISO screws have an identification mark on their heads as shown in Fig. 2-1.

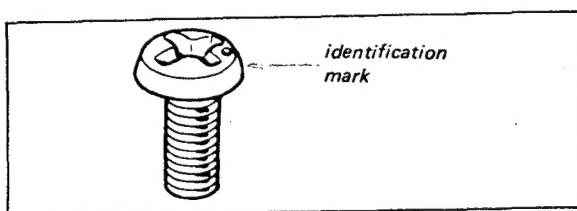
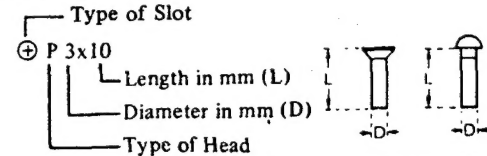


Fig. 2-1 ISO screw

Hardware Nomenclature

P	- Pan Head Screw		
PS	- Pan Head Screw with Spring Washer		
K	- Flat Countersunk Head Screw		
B	- Binding Head Screw		
RK	- Oval Countersunk Head Screw		
T	- Truss Head Screw		
R	- Round Head Screw		
F	- Flat Fillister Head Screw		
SC	- Set Screw		
E	- Retaining Ring (E Washer)		
	W	- Washer	
	SW	- Spring Washer	
	LW	- Lock Washer	
	N	- Nut	

Example -



2-3. TOP COVER AND FRONT PANEL REMOVAL

1. Remove the two machine screws at each side of the case, and lift off the top cover.
2. Remove all control knobs except the POWER switch knob by loosening the set screws, and pull off the POWER switch knob.
3. Remove the two screws (+P 4 X 6) securing the front panel from the back of the front subchassis as shown in Fig. 2-2.
4. Remove the two self-tapping screws (+B 3 X 6) securing the panel at the front edge of the bottom plate as shown in Fig. 2-3. This frees the front panel.

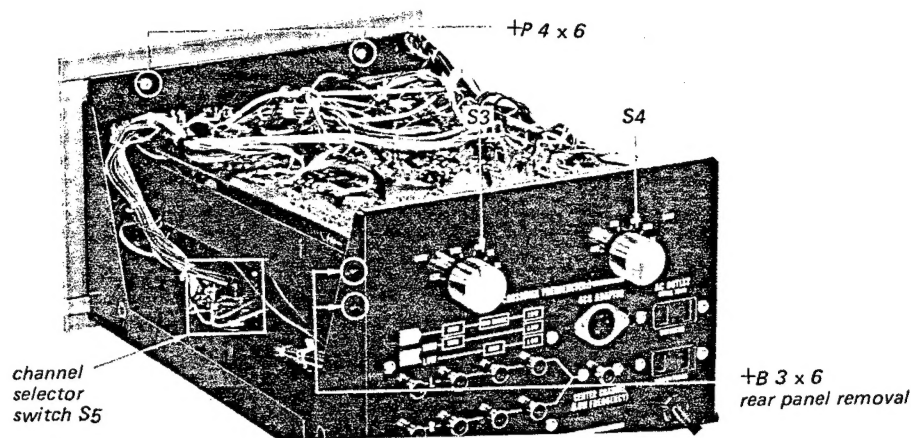


Fig. 2-2 Front panel removal

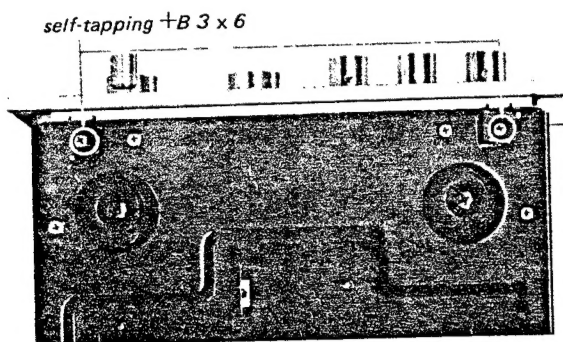


Fig. 2-3 Bottom view

2-4. PILOT LAMP REPLACEMENT

1. Remove the top cover as described in Procedure 2-3.
2. Straighten the tab of the meter-lamp holder to permit the removal of the meter-lamp socket.
3. Pull out the meter-lamp socket, and then unscrew the lamp from the socket and install the new lamp.

2-5. FILTER AMPLIFIER BOARD REMOVAL

1. Remove the top cover as described in Procedure 2-3.
2. Remove the control knob at the rear panel by loosening the set screw, and then remove the hex nut securing the CROSSOVER FREQUENCY switch to the rear panel.
3. Remove the two screws (+B 3 X 6) securing the filter amplifier board to the mounting bracket. This frees the filter amplifier board.

2-6. CONTROL AND SWITCH REPLACEMENT

Prepare for replacing any of the controls by removing the top cover or front panel as described in Procedure 2-3.

POWER Switch

1. Remove the two screws (+PS 3 X 6) securing the switch to the front subchassis as shown in Fig. 2-4.
2. Remove the defective switch, and then resolder the lead wires to the new switch's lugs one by one.
3. Install the replacement switch.

LOW CHANNEL FREQUENCY SHIFT Switch (S1)

1. Remove the hex nut securing the LOW CHANNEL FREQUENCY SHIFT switch to the front subchassis as shown in Fig. 2-4.
2. With a soldering-iron having a solder-sucking tip, clean the solder from each lug of the defective switch and the printed board. This frees the switch.
3. Install the replacement switch.

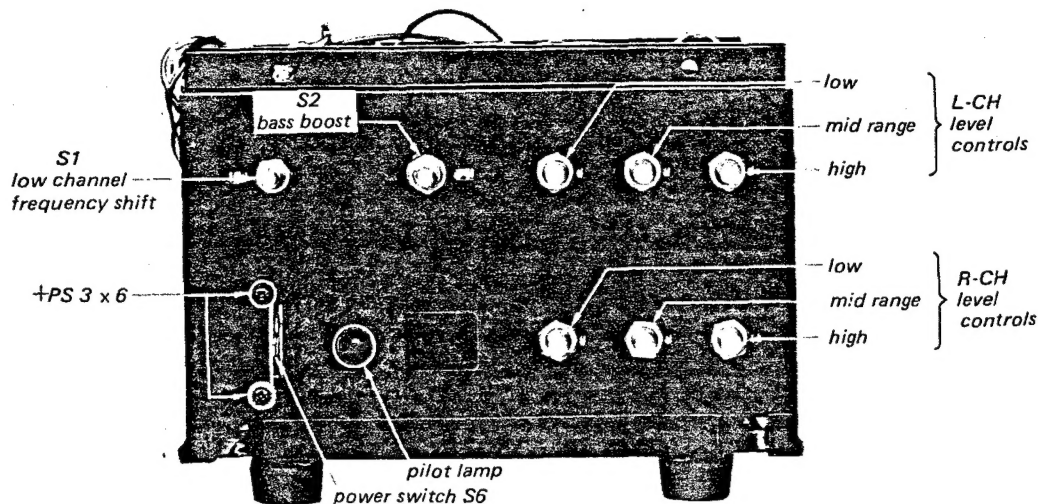


Fig. 2-4 Switch and control replacement

BASS BOOST Switch (S2)

1. Remove the hex nut securing the defective switch to the front subchassis. See Fig. 2-4.
2. Unsolder the lead wires and resistors from the defective switch, and then install the replacement switch.

LEVEL Control

1. Remove the hex nut securing each control to the front subchassis. See Fig. 2-4.
2. Unsolder the lead wires from the defective control, and then install the replacement control.

CROSSOVER FREQUENCY Switches (S3, S4)

1. Remove the filter amplifier board as described in Procedure 2-5.
2. With a soldering-iron having a solder-sucking tip, clean the solder from each lug of the defective switch and the printed board. This frees the switch.
3. Install the replacement switch.

Channel Selector Switch (S5)

1. Remove the two screws (+B 3 X 6) securing the switch mounting bracket to the bottom plate as shown in Fig. 2-5.
2. Remove the hex nut securing the defective switch to the bracket.
3. Unsolder the lead wires from the defective switch, and then install the replacement switch.

2-7. REAR PANEL REMOVAL

1. Remove the top cover as described in Procedure 2-3.
2. Remove the filter amplifier board as described in Procedure 2-5.

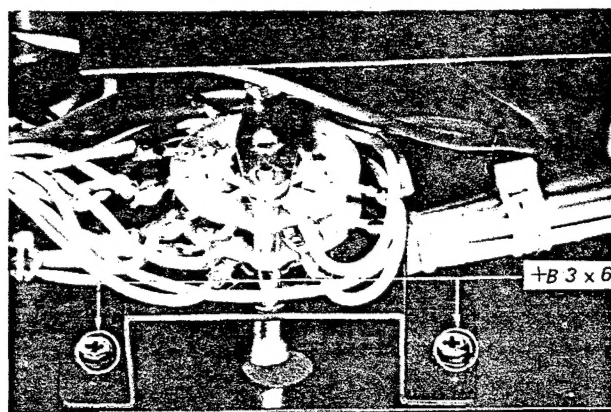


Fig. 2-5 Channel Selector switch removal

3. Remove the two screws (+B 3 X 6) at each side of the rear panel as shown in Fig. 2-2.
4. Remove the four self-tapping screws (+B 3 X 6) from the bottom edge of the chassis as shown in Fig. 2-6. This frees the rear panel.

2-8. REPLACEMENT OF COMPONENTS SECURED TO THE REAR PANEL BY RIVETS

1. Remove the rear panel as described in Procedure 2-7.
2. Bore out the rivets using a drill bit slightly larger in diameter than the rivet. See Fig. 2-7.

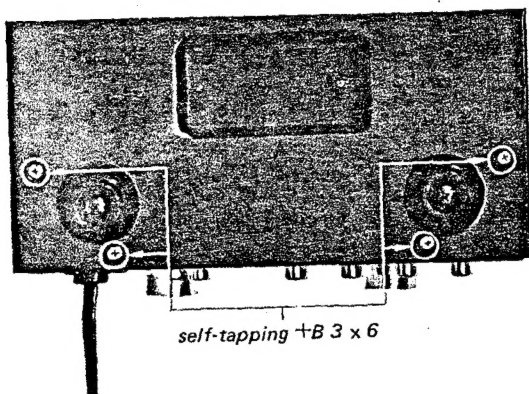


Fig. 2-6 Rear panel removal

3. Punch out the remainder of the rivets with a nail set or prick punch.
4. Remove the defective component, and then install a new one.
5. Secure the new component with suitable screws and nuts or repair rivet screws (part number 3-701-402).

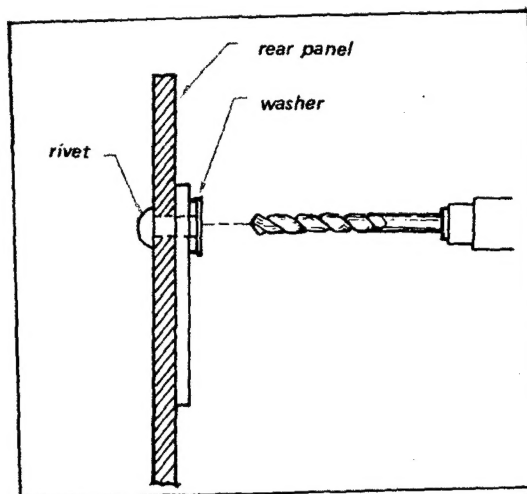


Fig. 2-7 Rivet replacement

SECTION 3

OVERALL CHECKS AND MEASUREMENTS

3-1. TEST EQUIPMENT REQUIRED

1. Audio Oscillator

Frequency range 10 Hz to 100 kHz
 Distortion 0.03% or less at
 1 kHz

2. Distortion Meter

Capable of measuring of 0.015% distortion or
 less at 1 kHz.
 Frequency range 20 Hz to 100 kHz
 Input impedance 1 megohm or more

3. Ac VTVM

Capable of measuring rms voltage of 0.5 mV
 or less within a frequency range from 10 Hz
 to 100 kHz.
 Input impedance 500 k ohms or
 more

4. Attenuator

Capable of attenuating signals 60 dB or more.
 Characteristic impedance 600 ohms
 unbalanced.

5. Oscilloscope

Bandwidth 1 MHz or more

Note: 0 dB = 0.775 V (rms)

3-2. LEVEL CHECK WITHIN PASSBAND

Preparation

Set the controls and switches as follows:

LOW CHANNEL FREQUENCY

SHIFT switch (S1) NORMAL

BASS BOOST switch (S2) 0 dB

CHANNEL SELECT switch (S5) ... 3 CH

LEVEL control maximum

Procedure

With the equipment connected as shown in Fig. 3-1,
 follow the procedures given in Table 3-1.

TABLE 3-1 LEVEL CHECK WITHIN PASSBAND

OUTPUT Jack	CROSSOVER FRE- QUENCY Selector Switch		Input Signal Level and Frequency	Output Level
	S3(HIGH)	S4(LOW)		
LOW	8 kHz	1 kHz	10 Hz, 0 dB 100 Hz, 0 dB.	-1.3 ± 1 dB -0.5 ± 0.5 dB
MID	8 kHz	150 HZ	1 kHz, 0 dB	0.5 ± 0.5 dB
HIGH	1.5 kHz	150 Hz	10 kHz, 0 dB 100 kHz, 0 dB	-0.5 ± 0.5 dB 0 ~ 1.5 dB
4P Socket for 4 CH ADAPTOR ② or ④ to ground See Fig. 3-2.	1.5 kHz	150 Hz	10 kHz, 0 dB	-0.5 ± 0.5 dB

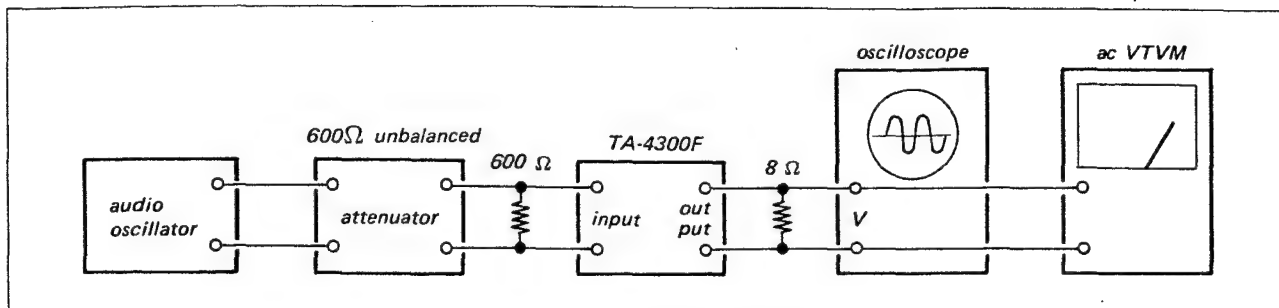


Fig. 3-1 Level check test setup

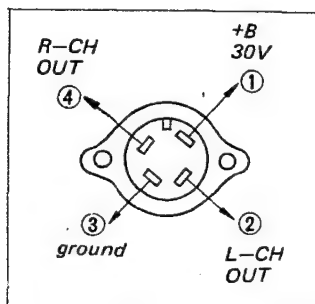


Fig. 3-2 Detail of 4 CH connector

3-3. LEVEL CHECK AT CROSSOVER FREQUENCY

Preparation

Connect the equipment as shown in Fig. 3-1. Then, set the controls and switches as follows:

Description	Position
LOW CHANNEL FREQUENCY	
SHIFT switch	NORMAL
BASS BOOST switch	0 dB
Channel Selector switch	3 CH

High-Frequency Output Level Adjustment

Set CROSSOVER FREQUENCY selector switch S3(HIGH) to 1.5 kHz, and S4 (LOW) to 150 Hz. Feed a 10 kHz 2 dB signal to the INPUT jacks, and then adjust the "HIGH" LEVEL controls to obtain 0 dB readings at the HIGH OUTPUT jacks.

Mid-Frequency Output Level Adjustment

Set CROSSOVER FREQUENCY selector switch S3 (HIGH) to 8 kHz, and S4 (LOW) to 150 Hz. Feed a 1 kHz, 2 dB signal to the INPUT jack, and then adjust the "MID" LEVEL controls to obtain 0 dB readings at the MID RANGE OUTPUT jacks.

Low-Frequency Output Level Adjustment

Set CROSSOVER FREQUENCY selector switch S3 (HIGH) to 8 kHz, and S4 (LOW) to 1 kHz. Feed a 50 Hz, 2 dB signal to the INPUT jacks and then adjust the "LOW" LEVEL controls to obtain 0 dB readings at the LOW OUTPUT jacks.

Procedure

1. With the equipment connected as shown in Fig. 3-1, feed a 1 kHz, 2 dB signal to the INPUT connectors.
2. Set CROSSOVER FREQUENCY selector switch S4 (LOW) to 150 Hz.
3. Measure the output levels of the HIGH and MID RANGE outputs, while simultaneously changing the crossover frequency and input signal frequency from 1.5 kHz to 8 kHz. The outputs should be within the limit of -3.2 ± 0.8 dB.
4. Set CROSSOVER FREQUENCY selector switch S3 (HIGH) to 8 kHz.
5. Measure the output levels of the MID RANGE and LOW outputs while simultaneously changing the crossover frequency and input signal frequency from 150 Hz to 1 kHz. The outputs should be within the limit of -3.2 ± 0.8 dB.

3-4. BASS BOOST CHECK

Preparation

Set the controls and switches as follows:

<u>Description</u>	<u>Position</u>
LOW CHANNEL FREQUENCY SHIFT switch (S1)	NORMAL
CROSSOVER FREQUENCY selector switch-HIGH (S3)	8 kHz
CROSSOVER FREQUENCY selector switch-LOW (S4)	1 kHz
Channel Selector switch (S5) . . .	3 CH

Procedure

1. With the equipment connected as shown in Fig. 3-1, adjust the LOW LEVEL control to obtain a 0 dB output signal level when supplying a 20 Hz, +2 dB signal and the BASS BOOST switch (S2) is set to 0 dB.
2. Change the BASS BOOST switch (S2) setting as indicated in Table 3-2, and then increase the attenuation to obtain a 0 dB level at the LOW OUTPUT jack. The attenuation required indicates the bass boost value, and should be within the limits given in Table 3-2.

TABLE 3-2 BASS BOOST CHECK

S2 Position	3	6	12	18
Bass boost	3 ± 1 dB	6 ± 1.5 dB	12 ± 2 dB	18 ± 2 dB

3-5. CROSSTALK MEASUREMENT

Preparation

Set the controls and switches as follows:

<u>Description</u>	<u>Position</u>
LOW CHANNEL FREQUENCY SHIF switch (S1)	NORMAL
BASS BOOST switch (S2)	0 dB
Channel Selector switch (S5) . . .	3 CH
LEVEL controls	maximum

Procedure

1. With the equipment connected as shown in Fig. 3-3, feed a signal to the left channel INPUT jack as specified in Table 3-3 to obtain a 0 dB output.
2. Switch the signal to the right channel INPUT and read the residual signal level in the left channel output.
3. The 0 dB output-level to residual-level ratio represents the channel crosstalk. Check the crosstalk according to the procedures given in Table 3-3.

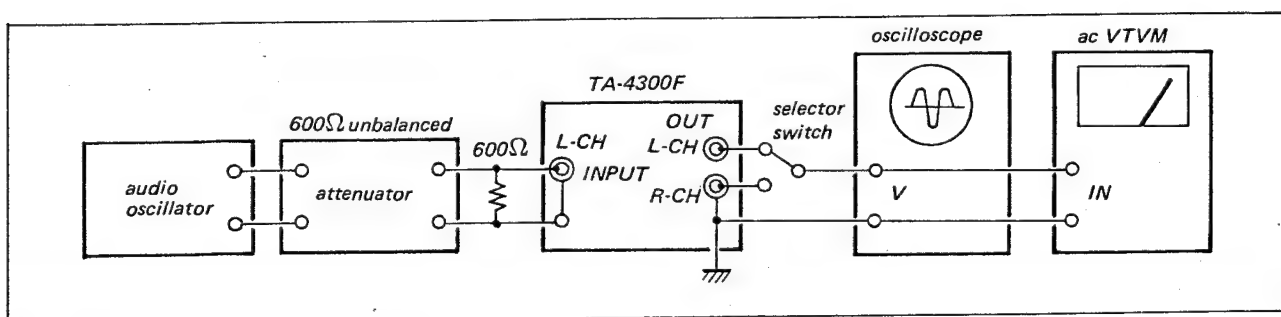


Fig. 3-3 Crosstalk measurement test setup

Description

Position

LOW CHANNEL FREQUENCY

SHIFT switch (S1) NORMAL

BASS BOOST switch (S2) 0 dB

Channel selector switch (S5) 3 CH

LEVEL control maximum

2. Adjust potentiometer R566 (semifixed resistor) See Fig. 3-6, so that the positive and negative peaks of the output waveform are simultaneously clipped.
3. After completing this adjustment, apply a drop of lock paint to R566.

Procedure

1. With the equipment connected as shown in Fig. 3-5, feed a signal as specified in Table 3-5, to obtain a 15.2 dB (4.5 V rms) output.
2. Measure the harmonic distortion.

Clipping Point Adjustment for LOW Channel

Preparation

Same as harmonic distortion measurement.

Procedure

1. Feed in a 100 Hz signal to obtain a 19 dB (7.0 V) output level at the LOW output jack.

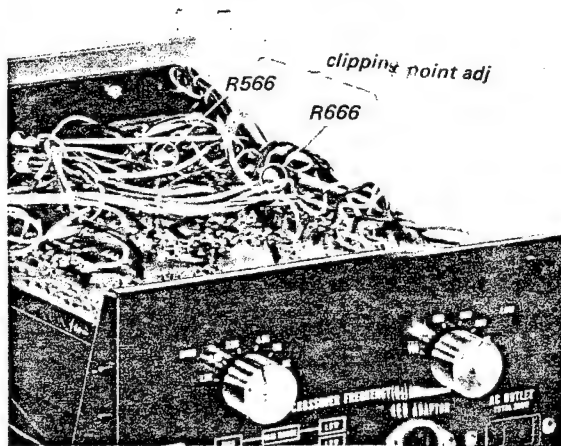


Fig. 3-6 Parts location

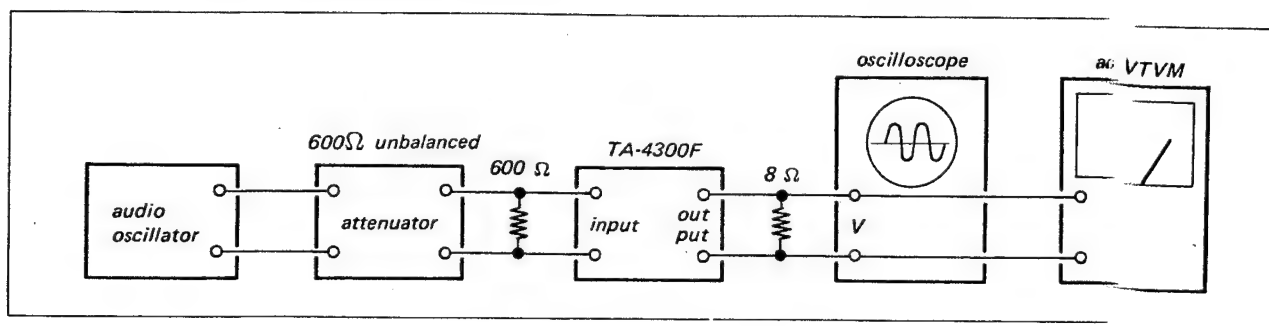


Fig. 3-5 Harmonic distortion test setup

TABLE 3-5 HARMONIC DISTORTION MEASUREMENT

OUTPUT Jack	CROSSOVER FREQUENCY Selector Switch		Input Signal Frequency	Harmonic Distortion
	S3(HIGH)	S4(LOW)		
LOW	8 kHz	1 kHz	100 Hz	0.1% or less
MID	8 kHz	150 Hz	1 kHz	0.1% or less
HIGH	1.5 kHz	150 Hz	10 Hz	0.1% or less

3-8. CHANNEL SELECTOR SWITCH OPERATIONAL CHECK

Preparation

Set the controls and switches as follows:

<u>Description</u>	<u>Position</u>
LOW CHANNEL FREQUENCY	
SHIFT switch (S1)	NORMAL
BASS BOOST switch	0 dB

CROSSOVER FREQUENCY

Selector switch	
S3 (HIGH)	8 kHz
S4 (LOW)	150 Hz
Level controls	maximum

Procedure

1. With the equipment oconnected as shown in Fig. 3-1, check the output level while changing the input signal frequency as directed in the Table 3-6.

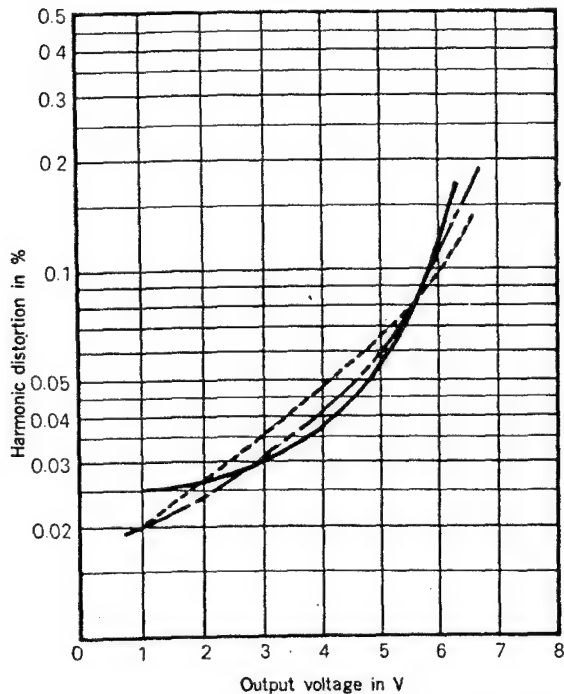
TABLE 3-6 CHANNEL SELECTOR SWITCH OPERATIONAL CHECK

Channel Selector Switch Position	2 CH LOW	2 CH HIGH	4 CH	
Input Signal Frequency OUTPUT Jack	150 Hz 0 dB	8 kHz 0 dB	150 Hz 0 dB	8 kHz 0 dB
LOW	-3.0 ±1 dB	-3.0 ±1 dB	-3.0 ±1 dB	
MID	-3.0 ±1 dB		-3.0 ±1 dB	-3.0 ±1 dB
HIGH		-3.0 ±1 dB		

SECTION 4

PERFORMANCE CURVES

HARMONIC DISTORTION vs OUTPUT VOLTAGE CURVES (within the passband)



LOW CHANNEL FREQUENCY

SHIFT switch NORMAL

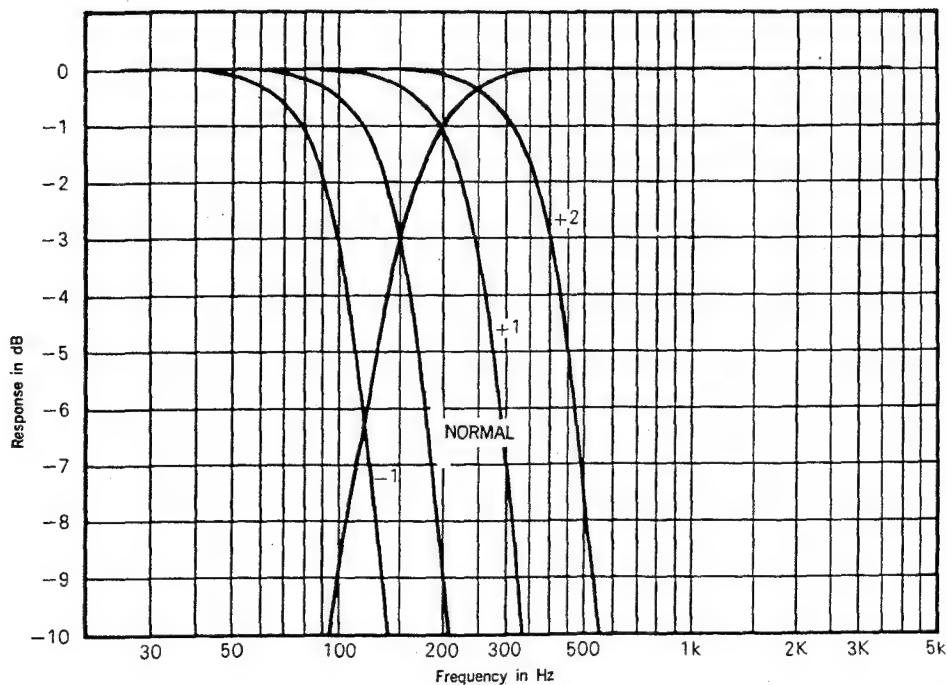
BASS BOOST switch 0 dB

— 10kHz
 - - - 1kHz
 - . - 100Hz

Channel Selector Switch 3 CH

LEVEL controls Maximum

LOW CHANNEL FREQUENCY SHIFT RESPONSE



CROSSOVER FREQUENCY switch (LOW) 150 Hz

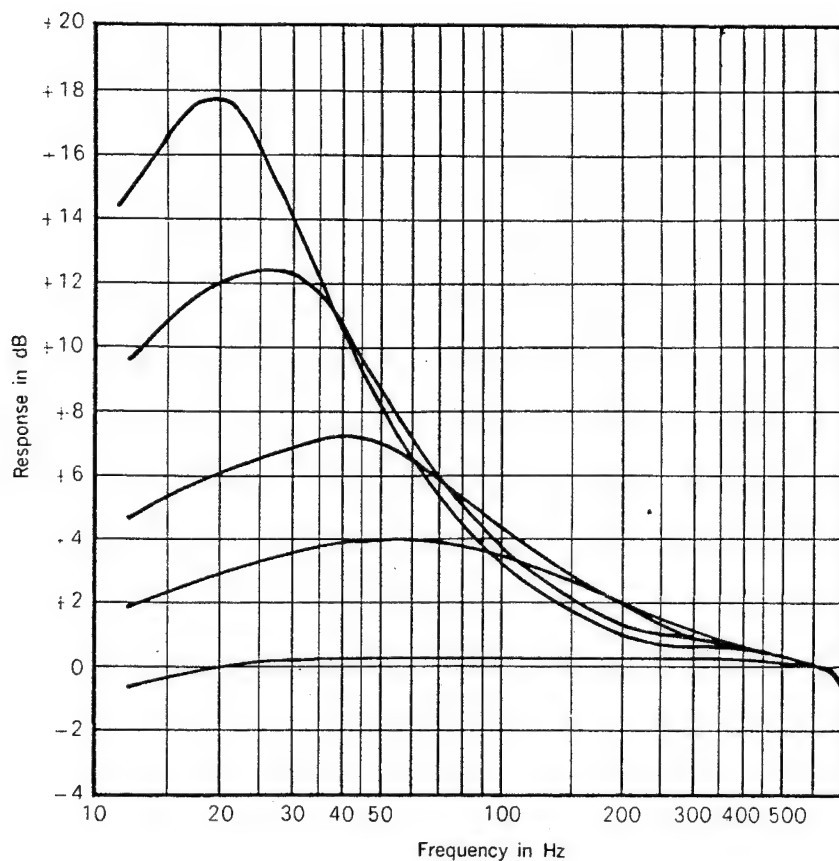
CROSSOVER FREQUENCY switch (HIGH) 8 kHz

BASS BOOST switch 0 dB

Channel Selector switch 3 CH

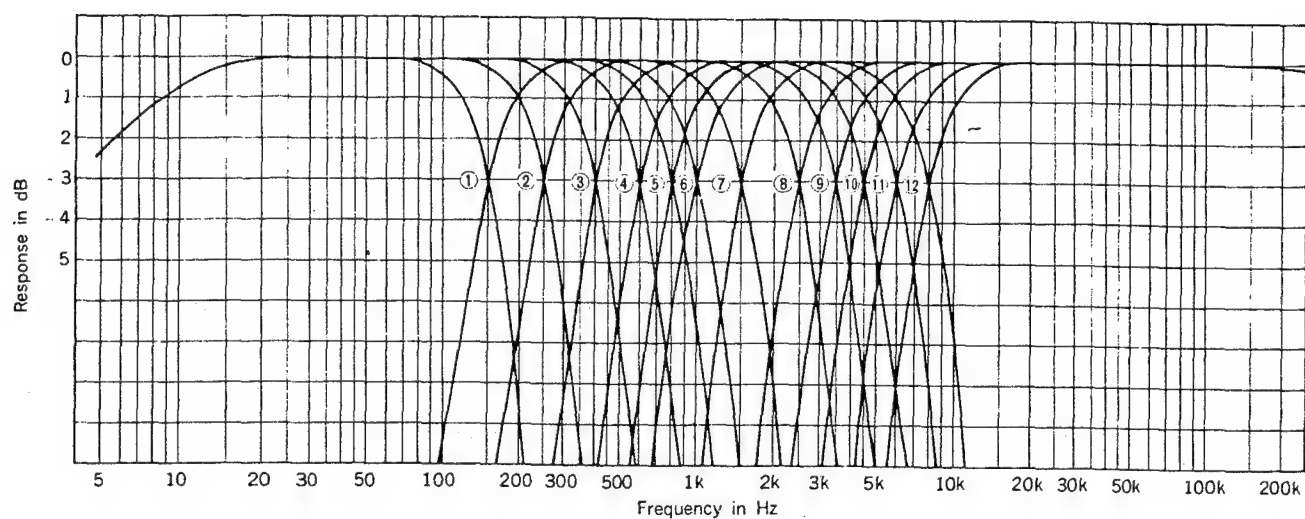
LEVEL controls Maximum

BASS BOOST RESPONSE.



LOW CHANNEL FREQUENCY SHIFT switch NORMAL
 CROSSOVER FREQUENCY switch (LOW) 1 kHz

WARRANT



Note:

CROSSOVER FREQUENCY (LOW)

- | | |
|---|-------|
| 1 | 150Hz |
| 2 | 250Hz |
| 3 | 400Hz |
| 4 | 600Hz |
| 5 | 800Hz |
| 6 | 1kHz |

CROSSOVER FREQUENCY (HIGH)

- | | |
|----|--------|
| 7 | 1.5kHz |
| 8 | 2.5kHz |
| 9 | 3.5kHz |
| 10 | 4.5kHz |
| 11 | 6 kHz |
| 12 | 8 kHz |

(Set the CROSSOVER FREQUENCY switch-HIGH to 8 kHz)

(Set the CROSSOVER FREQUENCY switch-LOW to 150 Hz)

LOW CHANNEL FREQUENCY SHIFT switch	NORMAL
BASS BOOST switch	0 dB
Channel Selector switch	3 CH
LEVEL controls	Maximum

SECTION 5 REPACKING

The TA-4300F's original shipping carton and packing material are the ideal containers for shipping the unit. However, to secure the maximum protection the

TA-4300F must be repacked in these materials precisely as before. The proper repacking procedure is shown in Fig. 5-1.

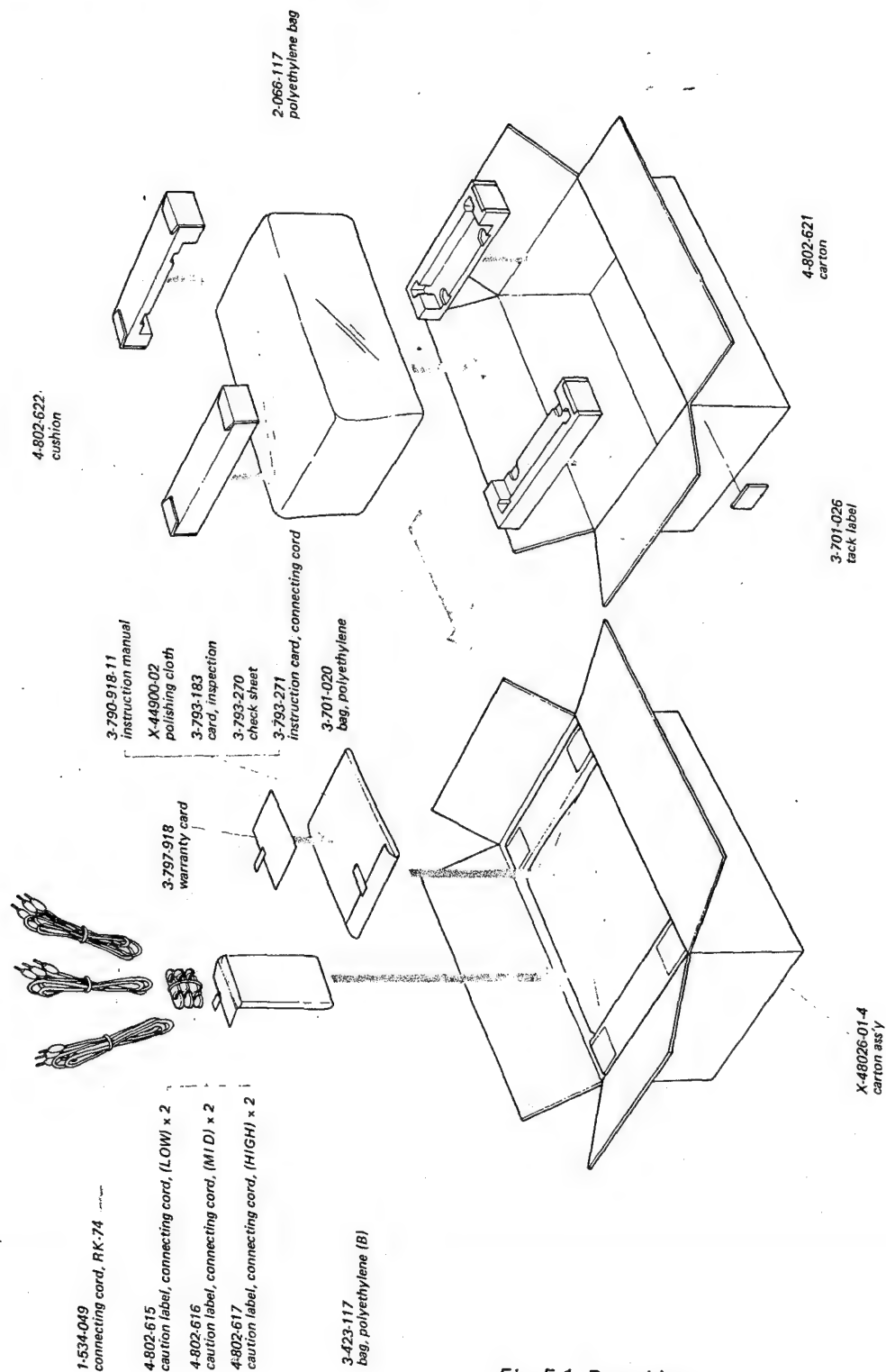
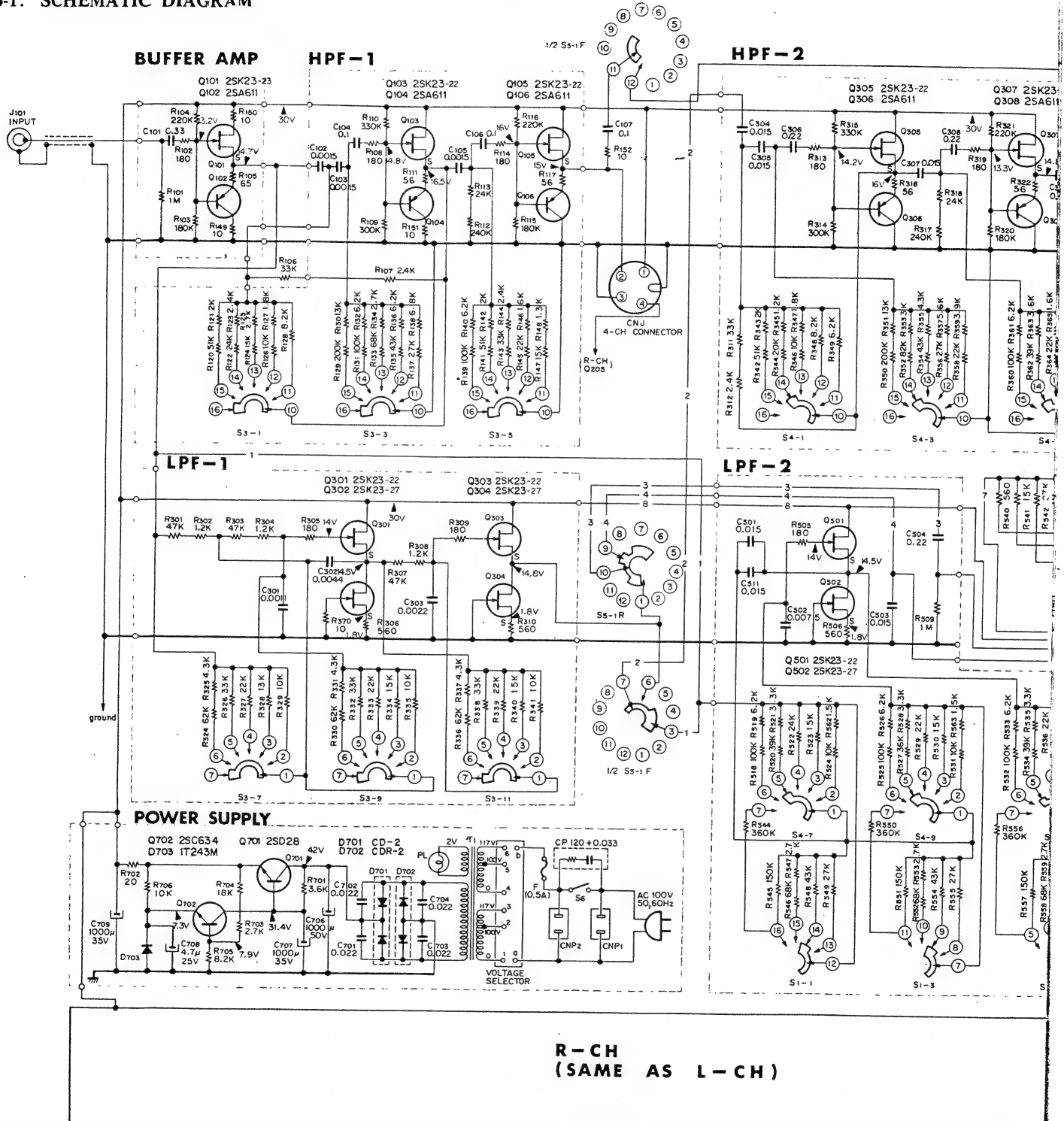
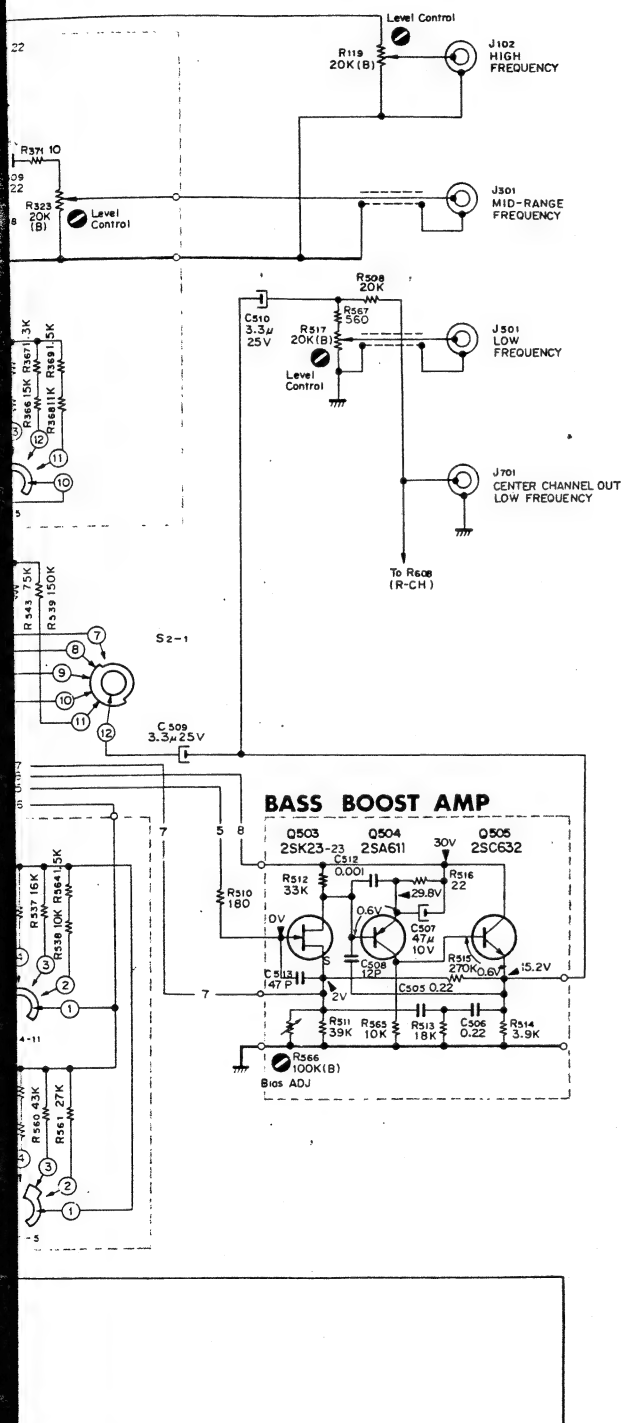


Fig. 5-1 Repacking

SECTION 6 DIAGRAMS

6-1. SCHEMATIC DIAGRAM

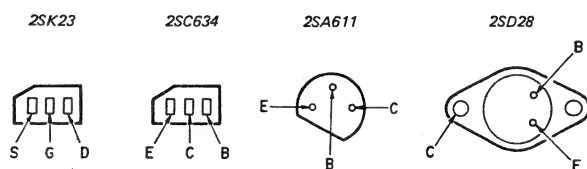




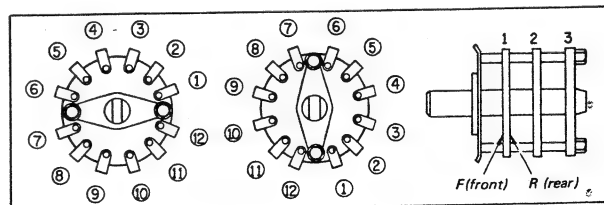
Ref. No.	Description	Position
S1	LOW CHANNEL FREQ. SHIFT sw. (-1, NORMAL +1 +2)	+1
S2	BASS BOOST sw. (0, 3, 6, 12, 18 dB)	3 dB
S3	CROSSOVER FREQ. selector sw (HIGH) (1.5 kHz, 2.5 kHz, 3.5 kHz, 4.5 kHz, 6 kHz, 8 kHz)	1.5 kHz
S4	CROSSOVER FREQ. (150 Hz, 250 Hz, 400 Hz, 600 Hz, 800 Hz, 1 kHz)	400 Hz
S5	Channel Selector sw (2 CH (LOW), 2 CH (HIGH), 3 CH, 4 CH)	2 CH. LOW

Note:

All resistance values are in ohms, k=1000, M=1000 k
 All capacitance values are in μF except as indicated with
 p, which means μpF .
 All voltages represent an average value and should hold
 within $\pm 20\%$.
 All voltages are dc measured with a VOM which has an
 input impedance of 20 k ohms/volt. No signal in.



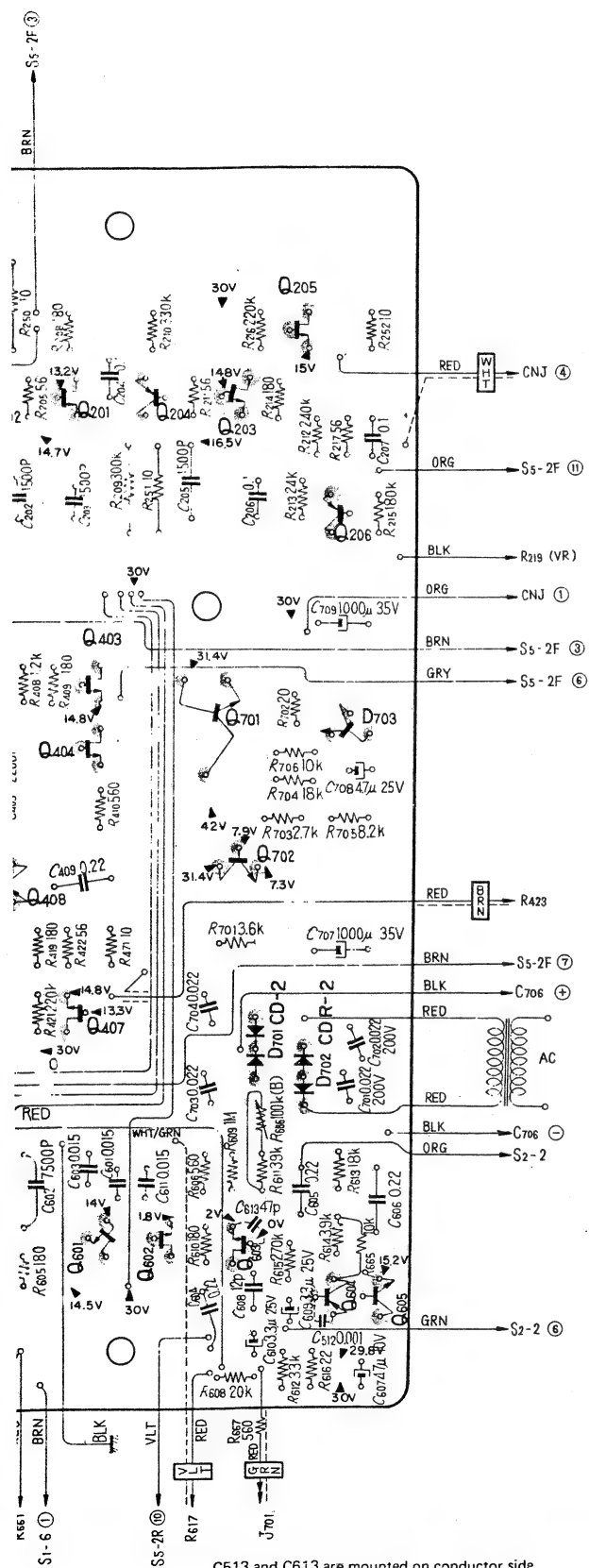
ROTARY SWITCH INDEX (S2, S5)



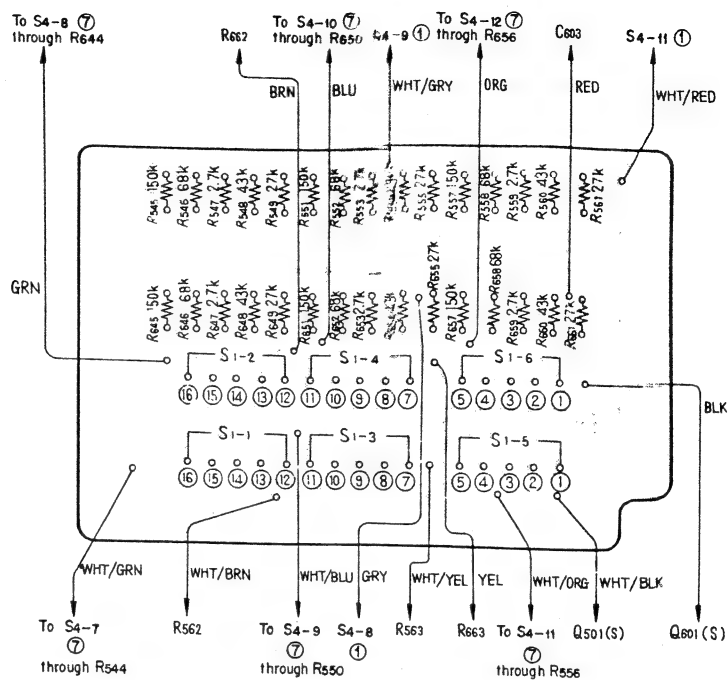
SONY
TA-4300F
 © 1970

—Conductor Side—





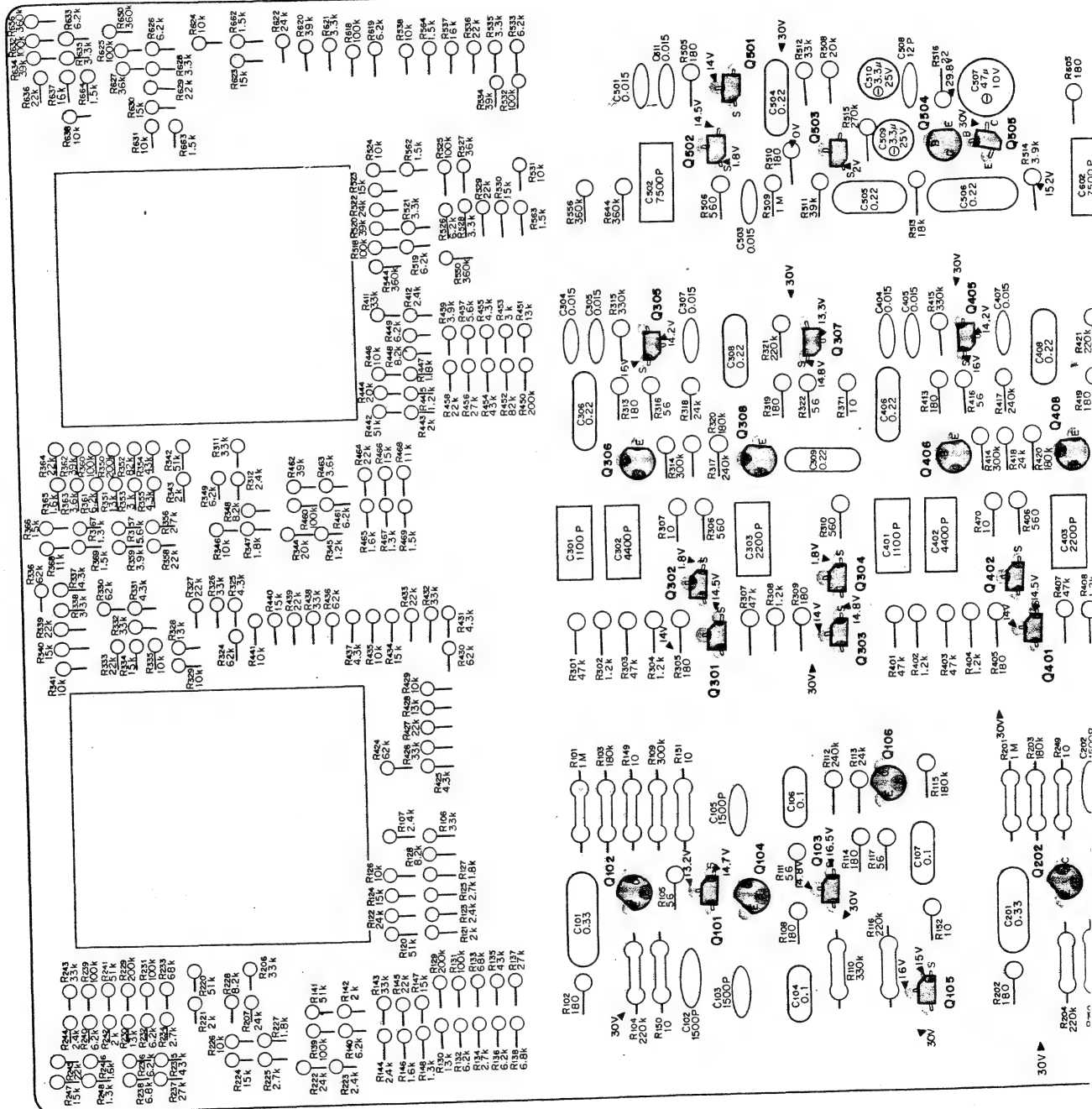
C513 and C613 are mounted on conductor side.

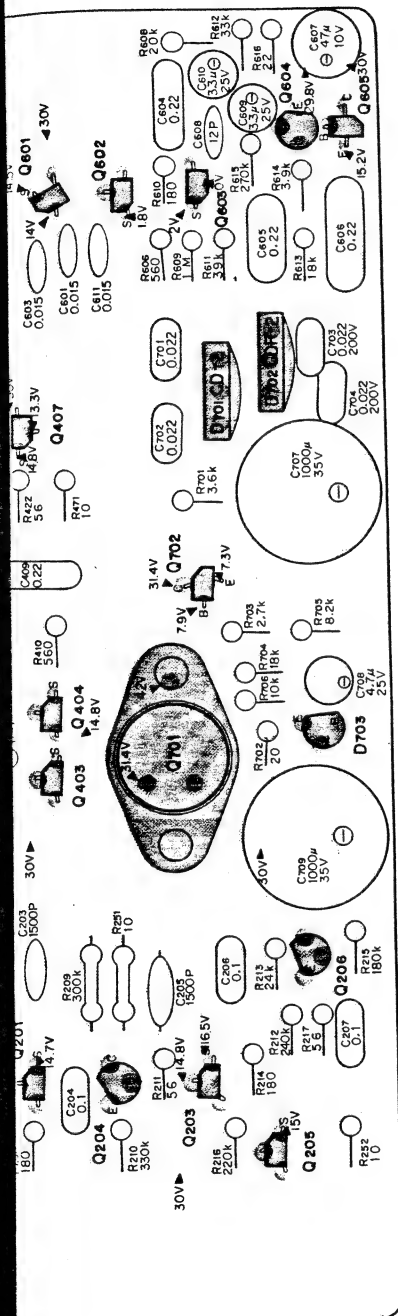


Q101(Q201),	2SK23-23
Q102(Q202),	2SA611
Q103(Q203),	2SK23-22
Q104(Q204),	2SA611
Q105(Q205),	2SK23-22
Q106(Q206),	2SA611
Q301(Q401),	2SK23-22
Q302(Q402),	2SK23-27
Q303(Q403),	2SK23-22
Q304(Q404),	2SK23-27
Q305(Q405),	2SK23-22
Q306(Q406),	2SA611
Q307(Q407),	2SK23-22
Q308(Q408),	2SA611
Q501(Q601),	2SK23-22
Q502(Q602),	2SK23-27
Q503(Q603),	2SK23-23
Q504(Q604),	2SA611
Q505(Q605),	2SC632
Q701	2SD-28
Q702	2SC634

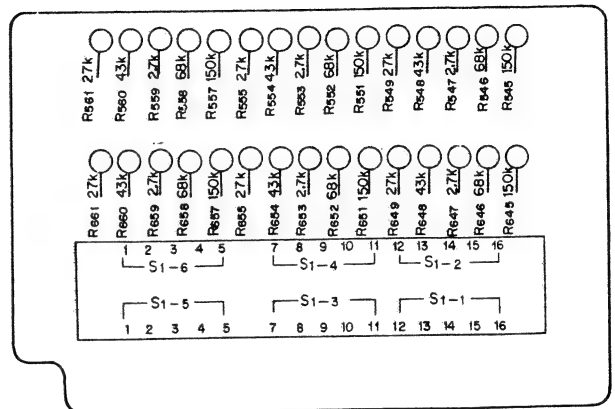
6-2. MOUNTING DIAGRAM

-Component Side-



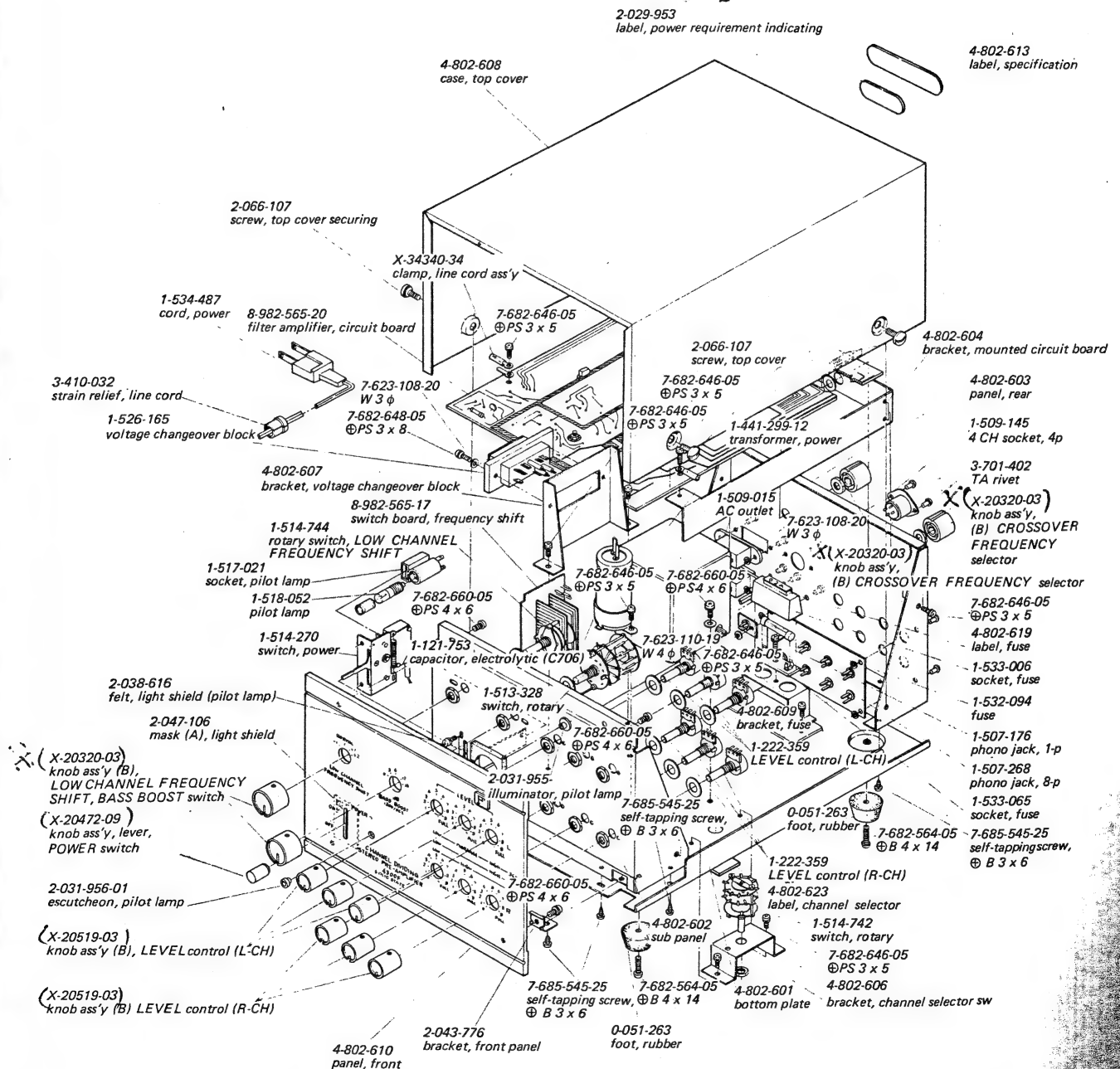


C513 and C613 are mounted on conductor side.



- Q101(Q201), 2SK23-23
- Q102(Q202), 2SA611
- Q103(Q203), 2SK23-22
- Q104(Q204), 2SA611
- Q105(Q205), 2SK23-22
- Q106(Q206), 2SA611
- Q301(Q401), 2SK23-22
- Q302(Q402), 2SK23-27
- Q303(Q403), 2SK23-22
- Q304(Q404), 2SK23-27
- Q305(Q405), 2SK23-22
- Q306(Q406), 2SA611
- Q307(Q407), 2SK23-22
- Q308(Q408), 2SA611
- Q501(Q601), 2SK23-22
- Q502(Q602), 2SK23-27
- Q503(Q603), 2SK23-23
- Q504(Q604), 2SA611
- Q505(Q605), 2SC632
- Q701 2SD-28
- Q702 2SC634

SECTION 7 EXPLODED VIEW



X. Look Supp. No 1

SECTION 8

ELECTRICAL PARTS LIST

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
Mounted Circuit Boards			C301(C401)	1-109-213	1100p $\pm 5\%$ 100V mica
	8-982-565-20	filter amplifier circuit board	C302(C402)	1-109-215	4400p $\pm 5\%$ 100V mica
	8-982-565-17	switch board, frequency shift	C303(C403)	1-109-214	2200p $\pm 5\%$ 100V mica
Semiconductors			C304(C404)	1-106-029-12	0.015 $\pm 5\%$ 50V mylar
D701		diode, CD-2	C305(C405)	1-106-029-12	0.015 $\pm 5\%$ 50V mylar
D702		diode, CDR-2	C306(C406)	1-105-689-12	0.22 $\pm 10\%$ 50V mylar
D703		diode, 1T243M	C307(C407)	1-106-029-12	0.015 $\pm 5\%$ 50V mylar
Q101(Q201)		FET, 2SK23-23	C308(C408)	1-105-689-12	0.22 $\pm 10\%$ 50V mylar
Q102(Q202)		transistor, 2SA611	C309(C409)	1-105-689-12	0.22 $\pm 10\%$ 50V mylar
Q103(Q203)		FET, 2SK23-22	C501(C601)	1-106-029-12	0.015 $\pm 5\%$ 50V mylar
Q104(Q204)		transistor, 2SA611	C502(C602)	1-109-216	7500p $\pm 5\%$ 100V mica
Q105(Q205)		FET, 2SK23-22	C503(C603)	1-106-029-12	0.015 $\pm 5\%$ 50V mylar
Q106(Q206)		transistor, 2SA611	C504(C604)	1-105-689-12	0.22 $\pm 10\%$ 50V mylar
Q301(Q401)		FET, 2SK23-22	C505(C605)	1-106-057-12	0.22 $\pm 5\%$ 50V mylar
Q302(Q402)		FET, 2SK23-27	C506(C606)	1-106-057-12	0.22 $\pm 5\%$ 50V mylar
Q303(Q403)		FET, 2SK23-22	C507(C607)	1-121-408	47 +150-10% 10V electrolytic
Q304(Q404)		FET, 2SK23-27	C508(C608)	1-107-109	12p $\pm 10\%$ 50V silvered mica
Q305(Q405)		FET, 2SK23-22	C509(C609)	1-121-344	3.3 +150-10% 25V electrolytic
Q306(Q406)		transistor, 2SA611	C510(C610)	1-121-344	3.3 +150-10% 25V electrolytic
Q307(Q407)		FET, 2SK23-22	C511(C611)	1-106-029-12	0.015 $\pm 5\%$ 50V mylar
Q308(Q408)		transistor, 2SA611	C512(C612)	1-105-661-12	0.001 $\pm 10\%$ 50V mylar
Q501(Q601)		FET, 2SK23-22	C513(C613)	1-107-123	47p $\pm 10\%$ 50V silvered mica
Q502(Q602)		FET, 2SK23-27	C701	1-105-917-12	0.022 $\pm 20\%$ 200V mylar
Q503(Q603)		FET, 2SK23-23	C702	1-105-917-12	0.022 $\pm 20\%$ 200V mylar
Q504(Q604)		transistor, 2SA611	C703	1-105-917-12	0.022 $\pm 20\%$ 200V mylar
Q505(Q605)		transistor, 2SC632	C704	1-105-917-12	0.022 $\pm 20\%$ 200V mylar
Q701		transistor, 2SD28	C706	1-121-753	1000 50V electrolytic
Q702		transistor, 2SC634	C707	1-121-388	1000 +150-10% 35V electrolytic
			C708	1-121-395	4.7 +150-10% 25V electrolytic
			C709	1-121-388	1000 +150-10% 35V electrolytic
			Resistors		
			All resistance values are in Ω , $\pm 5\%$, 1/4 W and carbon type unless otherwise indicated		
Transformer			R101(R201)	1-244-745	1M
T	1-441-299	transformer, power	R102(R202)	1-242-655	180
Capacitors			R103(R203)	1-244-727	180K
All capacitance values are in μF , except as indicated with p, which means μF .			R104(R204)	1-244-729	220K
C101(C201)	1-105-691-12	0.33 $\pm 10\%$ 200V mylar	R105(R205)	1-242-643	56
C102(C202)	1-106-005-12	1500p $\pm 5\%$ 50V mylar	R106(R206)	1-242-709	33K
C103(C203)	1-106-005-12	1500p $\pm 5\%$ 50V mylar	R107(R207)	1-242-682	2.4K
C104(C204)	1-105-685-12	0.1 $\pm 10\%$ 50V mylar	R108(R208)	1-242-655	180
C105(C205)	1-106-005-12	1500p $\pm 5\%$ 50V mylar	R109(R209)	1-244-732	300K
C106(C206)	1-105-685-12	0.1 $\pm 10\%$ 50V mylar	R110(R210)	1-242-733	330K
C107(C207)	1-105-685-12	0.1 $\pm 10\%$ 50V mylar	R111(R211)	1-242-643	56
			R112(R212)	1-242-730	240K
			R113(R213)	1-242-706	24K
			R114(R214)	1-242-655	180

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
R115(R215)	1-242-727	180K
R116(R216)	1-244-729	220K
R117(R217)	1-244-643	56
R119(R219)	1-222-359	20K (B), variable
R120(R220)	1-242-714	51K
R121(R221)	1-242-680	2K
R122(R222)	1-242-706	24K
R123(R223)	1-242-682	2.4K
R124(R224)	1-242-701	15K
R125(R225)	1-242-683	2.7K
R126(R226)	1-242-697	10K
R127(R227)	1-242-679	1.8K
R128(R228)	1-242-695	8.2K
R129(R229)	1-242-728	200K
R130(R230)	1-242-700	13K
R131(R231)	1-242-721	100K
R132(R232)	1-242-692	6.2K
R133(R233)	1-242-717	68K
R134(R234)	1-242-683	2.7K
R135(R235)	1-242-712	43K
R136(R236)	1-242-692	6.2K
R137(R237)	1-242-707	27K
R138(R238)	1-242-693	6.8K
R139(R239)	1-242-721	100K
R140(R240)	1-242-692	6.2K
R141(R241)	1-242-714	51K
R142(R242)	1-242-680	2.0K
R143(R243)	1-242-709	33K
R144(R244)	1-242-682	2.4K
R145(R245)	1-242-705	22K
R146(R246)	1-242-678	1.6K
R147(R247)	1-242-701	15K
R148(R248)	1-242-676	1.3K
R149(R249)	1-244-625	10
R150(R250)	1-244-625	10
R151(R251)	1-244-625	10
R152(R252)	1-242-625	10
R301(R401)	1-242-713	47K
R302(R402)	1-242-675	1.2K
R303(R403)	1-242-713	47K
R304(R404)	1-242-675	1.2K
R305(R405)	1-242-655	180
R306(R406)	1-242-667	560
R307(R407)	1-242-713	47K
R308(R408)	1-242-675	1.2K
R309(R409)	1-242-655	180
R310(R410)	1-242-667	560
R311(R411)	1-242-709	33K
R312(R412)	1-242-682	2.4K
R313(R413)	1-242-655	180
R314(R413)	1-242-732	300K

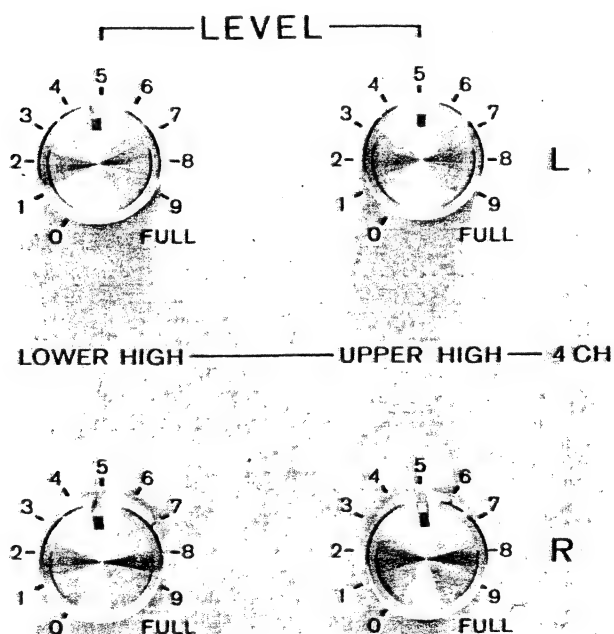
<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
R315(R415)	1-242-733	330K
R316(R416)	1-242-643	56
R317(R417)	1-242-730	240K
R318(R418)	1-242-706	24K
R319(R419)	1-242-655	180
R320(R420)	1-242-727	180K
R321(R421)	1-242-729	220K
R322(R422)	1-242-643	56
R323(R423)	1-222-359	20K (B), variable
R324(R424)	1-242-716	62K
R325(R425)	1-242-688	4.3K
R326(R426)	1-242-709	33K
R327(R427)	1-242-705	22K
R328(R428)	1-242-700	13K
R329(R429)	1-242-697	10K
R330(R430)	1-242-716	62K
R331(R431)	1-242-688	4.3K
R332(R432)	1-242-709	33K
R333(R433)	1-242-705	22K
R334(R433)	1-242-701	15K
R335(R435)	1-242-697	10K
R336(R436)	1-242-716	62K
R337(R437)	1-242-688	4.3K
R338(R438)	1-242-709	33K
R339(R439)	1-242-705	22K
R340(R440)	1-242-701	15K
R341(R441)	1-242-697	10K
R342(R442)	1-242-714	51K
R343(R443)	1-242-680	2K
R344(R444)	1-242-704	20K
R345(R445)	1-242-675	1.2K
R346(R446)	1-242-697	10K
R347(R447)	1-242-679	1.8K
R348(R448)	1-242-695	8.2K
R349(R449)	1-242-692	6.2K
R350(R450)	1-242-728	200K
R351(R451)	1-242-700	13K
R352(R452)	1-242-719	82K
R353(R453)	1-242-684	3.0K
R354(R454)	1-242-712	43K
R355(R455)	1-242-688	4.3K
R356(R456)	1-242-707	27K
R357(R457)	1-242-691	5.6K
R358(R458)	1-242-705	22K
R359(R459)	1-242-687	3.9K
R360(R460)	1-242-721	100K
R361(R461)	1-242-692	6.2K
R362(R462)	1-242-711	39K
R363(R463)	1-242-686	3.6K
R364(R464)	1-242-705	22K
R365(R465)	1-242-678	1.6K
R366(R466)	1-242-701	15K

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
R367(R467)	1-242-676	1.3K
R368(R468)	1-242-698	11K
R369(R469)	1-242-677	1.5K
R370(R470)	1-242-625	10
R371(R471)	1-242-625	10
R505(R605)	1-242-655	180
R506(R606)	1-242-667	560
R508(R608)	1-242-704	20K
R509(R609)	1-242-745	1M
R510(R610)	1-242-655	180
R511(R611)	1-242-711	39K
R512(R612)	1-242-709	33K
R513(R613)	1-242-703	18K
R514(R614)	1-242-687	3.9K
R515(R615)	1-242-731	270K
R516(R616)	1-242-633	22
R517(R617)	1-222-359	20K (B), variable
R518(R618)	1-242-721	100K
R519(R619)	1-242-692	6.2K
R520(R620)	1-242-711	39K
R521(R621)	1-242-685	3.3K
R522(R622)	1-242-706	24K
R523(R623)	1-242-701	15K
R524(R624)	1-242-697	10K
R525(R625)	1-242-721	100K
R526(R626)	1-242-692	6.2K
R527(R627)	1-242-710	36K
R528(R628)	1-242-685	3.3K
R529(R629)	1-242-705	22K
R530(R630)	1-242-701	15K
R531(R631)	1-242-697	10K
R532(R632)	1-242-721	100K
R533(R633)	1-242-692	6.2K
R534(R634)	1-242-711	39K
R535(R635)	1-242-685	3.3K
R536(R636)	1-242-705	22K
R537(R637)	1-242-702	16K
R538(R638)	1-242-697	10K
R539(R639)	1-244-725	150K
R540(R640)	1-244-667	560
R541(R641)	1-244-701	15K
R542(R642)	1-244-707	27K
R543(R643)	1-244-718	75K
R544(R644)	1-242-734	360K
R545(R645)	1-242-725	150K
R546(R646)	1-242-717	68K
R547(R647)	1-242-683	2.7K
R548(R648)	1-242-712	43K
R549(R649)	1-242-707	27K
R550(R650)	1-242-734	360K
R551(R651)	1-242-725	150K

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
R552(R652)	1-242-717	68K
R553(R653)	1-242-683	2.7K
R554(R654)	1-242-712	43K
R555(R655)	1-242-707	27K
R556(R656)	1-242-734	360K
R557(R657)	1-242-725	150K
R558(R658)	1-242-717	68K
R559(R659)	1-242-683	2.7K
R560(R660)	1-242-712	43K
R561(R661)	1-242-707	27K
R562(R662)	1-242-677	1.5K
R563(R663)	1-242-677	1.5K
R564(R664)	1-242-677	1.5K
R565(R665)	1-242-697	10K
R566(R666)	1-221-638	100K (B) semi-fixed
R567(R667)	1-244-667	560
R701	1-242-686	3.6K
R702	1-242-632	20
R703	1-242-683	2.7K
R704	1-242-703	18K
R705	1-242-693	6.8K
R706	1-242-697	10K
Switches		
S1	1-514-744	switch, LOW CHANNEL FREQUENCY SHIFT
S2	1-513-328	switch, BASS BOOST
S3	1-514-743	switch, CROSSOVER FREQUENCY SELECTOR (HIGH)
S4	1-514-743	switch, CROSSOVER FREQUENCY SELECTOR (MID-RANGE)
S5	1-514-742	switch, CHANNEL SELECTOR
S6	1-514-270	switch, POWER
Miscellaneous		
	1-509-145	connector, 7-p
	1-509-015	AC outlet
	1-231-057	encapsulated component (120 Ω + 0.033 μ F)
	1-507-268	phono jack, 4-p
	1-518-052	lamp, pilot
	1-526-165	voltage changeover block
	1-517-021	socket, pilot lamp
	1-533-066	socket, fuse
	1-534-487	cord, power
	1-507-176	phono jack, 1-p
	1-532-091	fuse 0.2A

4-CHANNEL ADAPTOR TAD-43F

SONY



4 CHANNEL ADAPTOR
TAD-43F
SOLID STATE

TABLE OF CONTENTS

<u>Section</u>	<u>Title</u>	<u>Page</u>	<u>Section</u>	<u>Title</u>	<u>Page</u>
1. TECHNICAL DESCRIPTION			3. OVERALL CHECKS AND MEASUREMENTS		
1-1.	Technical Specifications	31	3-1.	Test Equipment Required	37
1-2.	Detailed Circuit Analysis	31~32	3-2.	Level Check Within Passband	37
1-3.	Block Diagram	33	3-3.	Level Check at Crossover Frequency	37~38
2. DISASSEMBLY AND REPLACEMENT PROCEDURES			3-4.	Crosstalk Measurement	38
2-1.	Tools Required	34	3-5.	Noise Level Measurement	38~39
2-2.	Hardware Identification Guide	34	3-6.	Harmonic Distortion Measurement	39~40
2-3.	Top Cover and Front Panel Removal	34~35	4. REPACKING		40
2-4.	Filter Amplifier Board Removal	35	5. DIAGRAMS		
2-5.	Control and Switch Replacement ..	36	5-1.	Schematic Diagram	41
2-6.	Rear Panel Removal	36	5-2.	Mounting Diagram	42~43
2-7.	Replacement of Components Secured to the Rear Panel by Rivets	36	6. EXPLODED VIEW		44
			7. ELECTRICAL PARTS LIST		45~46

TA-4300
TA-4300

SECTION 1

TECHNICAL DESCRIPTION

1-1. TECHNICAL SPECIFICATIONS

Technical specifications for the TAD-43F are given in Table 1-1.

TABLE 1-1. TECHNICAL SPECIFICATIONS

Frequency response :	fc to 100 kHz ± 9 dB
	fc: crossover frequency
Crossover frequency :	3k, 4.5k, 6k, 8k, 10k, 12kHz
Output impedance :	Less than 5k ohms
Harmonic distortion :	0.03% at 1 V output
	0.1 % at 4 V output
	(each passband frequency)
	0.05% at 1 V output
	0.1 % at 2.5 V output
	(at crossover frequency)
Signal-to-noise ratio :	85 dB, shorted circuit (1 V input)
Maximum input signal level :	4.5 V
Power consumption :	Approx. 1 watt
Power requirement :	30 volts dc (from TA-4300F)
Dimensions :	100mm (width) X 149mm (height) X 316mm depth
	3 ¹⁵ / ₁₆ " (width) X 5 ⁷ / ₈ " (height) X 12 ⁷ / ₁₆ " (depth)
Net weight :	1.85 kg (4 lb)
Shipping weight :	2.35 kg (5 lb 1 oz)

1-2. DETAILED CIRCUIT ANALYSIS

The following describes the functions of all stages and controls. The text sequence follows signal paths. Stages are listed by transistor reference designation at left margin; major components are also listed in a similar manner. Refer to the block diagram on page 33 and schematic diagram on page 41.

Stage/Control

Input connector
CNP

Function

This socket is provided for connecting the TAD-43F to the TA-4300F. This socket accepts the dc power and the output of the high-pass filter (HPF-1) in the TA-4300F. Before describing the following circuit, note that following filter circuit consists of a pair of high-and-low pass filters having a variable crossover frequency fH' (3 kHz, 4.5 kHz, 6 kHz, 8 kHz, 10 kHz, or 12 kHz). Combining these filters and those in the TA-4300F, various kinds of 4-channel filters, having the crossover frequencies fL , fH , and fH' are obtained. See Fig. 1-1.

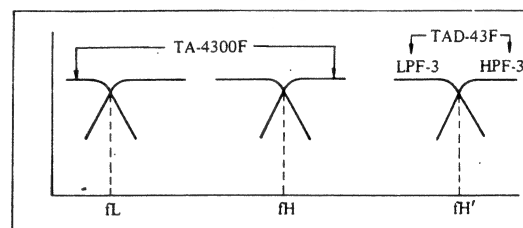


Fig. 1-1 Outputs of each of the four sections

High-pass filter
HPF-3

Three RC filters and two FET-PNP buffer amplifiers (Q101, Q102, Q103 and Q104) comprise a high-pass filter having six possible crossover frequencies. The RC networks for the high-pass filter (HPF-3) are composed of C101, C102 and C104 and the resistors connected to switch wafers S1-1, S1-3 and S1-5. FET-PNP buffer amplifiers are inserted between each RC filter to eliminate interaction between each RC filter. The positive feedback applied from the source of Q101 to C102 through R101 provides a sharp knee characteristic at the crossover frequency. To obtain a sharp rolloff of approximately 18 dB/octave, the design crossover frequencies of

Stage/Control

Function

three RC filters are $1/2$ the crossover, twice the crossover, and the crossover frequency respectively as shown in Fig. 1-2. The same is true for the other filters used in the TAD-43F.

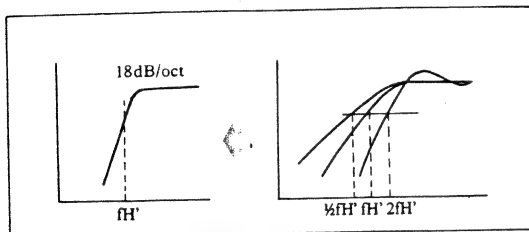


Fig. 1-2 Design of the sharp-cutoff RC filter

FET-PNP buffer amplifier
Q101, Q102

Presents the input signal with a high input impedance and drives the following filters. Q101 and Q102 form a modified source follower circuit in which Q102 acts not only as a constant-current source but also as a negative-going half-cycle drive amplifier. This combination amplifier has the advantage of low harmonic distortion and wide dynamic range. In addition, the FET generates less noise than conventional silicon transistors. The FETs used in this type of circuit are selected according to their I_{dss} rank, and care should be taken to use replacement components with the same I_{dss} . I_{dss} rank is indicated by the identification number as illustrated in Fig. 1-3.

The output of the high-pass filter containing highest frequency component is fed to the UPPER HIGH connector through R113 (LEVEL control).

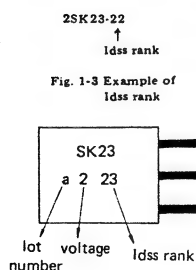


Fig. 1-3 Example of I_{dss} rank

Stage/Control

Function

Low-pass filter
LPF-3

Three RC filters and two FET-FET buffer amplifiers (Q301, Q302, Q303 and Q304) comprise a low-pass filter (LPF-3) having six crossover frequencies.

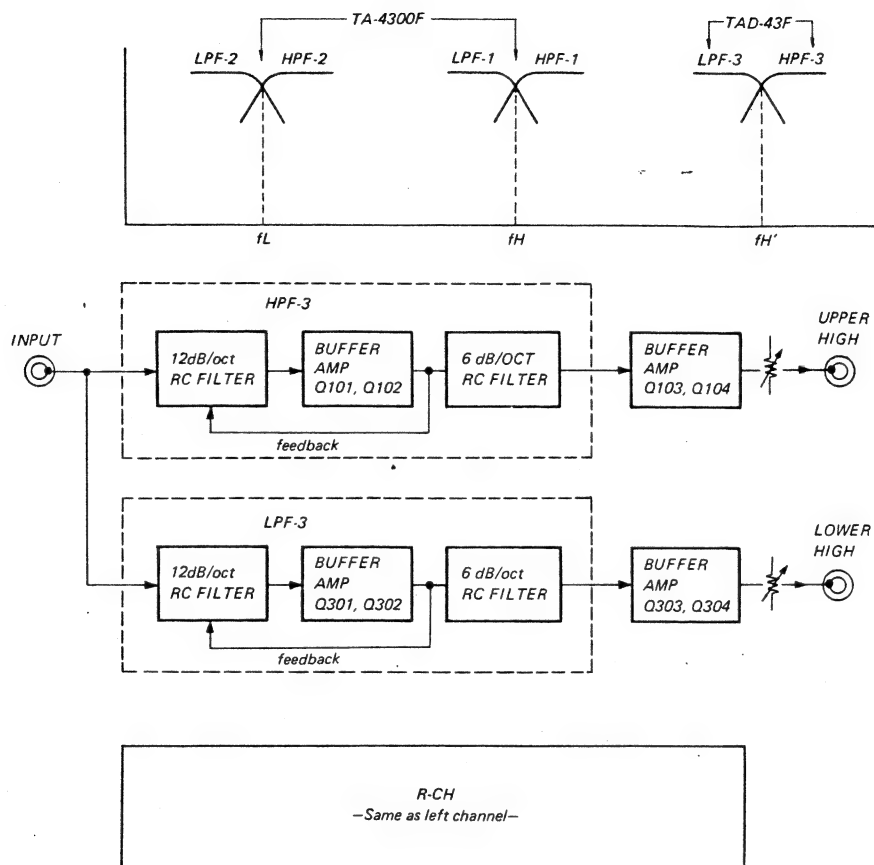
The RC network for the low-pass filter consists of C301, C302, C303 and C304 and the resistors connected to switch wafers S1-7, S1-9 and S1-11 (CROSSOVER FREQUENCY selector switch). This low-pass filter provides a crossover frequency of " $f_{H'}$ " and rolloff of about 18 dB/octave. Direct coupling is employed in this circuit to eliminate popping noise when changing the crossover frequency.

FET-FET buffer amplifier
Q301, Q302

Presents the input signal with a high-impedance and drives the following filters. Q301 and Q302 form a modified source follower circuit in which Q302 acts as a constant current source. This increases the dynamic range. In addition, the FET generates less noise than conventional silicon transistors. The output of the low-pass filter is fed to the LOWER HIGH connector through R313 (LEVEL control).

As the input signal is supplied through high-pass filter HPF-1 in the TA-4300F, the overall frequency characteristic obtained by combining this low-pass filter HPF-1 becomes that of a band-pass filter having a frequency characteristic between f_H and $f_{H'}$ as shown in Fig. 1-1.

1-3. BLOCK DIAGRAM



4. Remove the two self-tapping screws (+B 3 X 6) at each side of the chassis as shown in Fig. 2-3. Now the front subchassis can be tilted forward and down with front panel as shown in Fig. 2-4.
5. Remove the two screws (+PS 4 X 6) securing the front subchassis to the front panel as shown in Fig. 2-4. This frees the front panel.

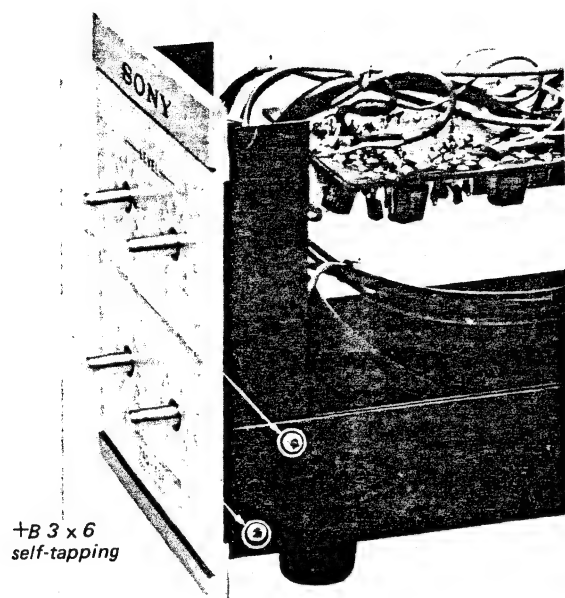


Fig. 2-3 Front subchassis removal

2.4. FILTER AMPLIFIER BOARD REMOVAL

1. Remove the top cover as described in Procedure 2-3.
2. Remove the control knob at the rear panel by loosening the set screw, and then remove the hex nut securing the CROSSOVER FREQUENCY switch to the rear panel. See Fig. 2-5.
3. Remove the two screws (+PS 3 X 5) securing the filter amplifier board to the mounting bracket. This frees the filter amplifier board. See Fig. 2-5.

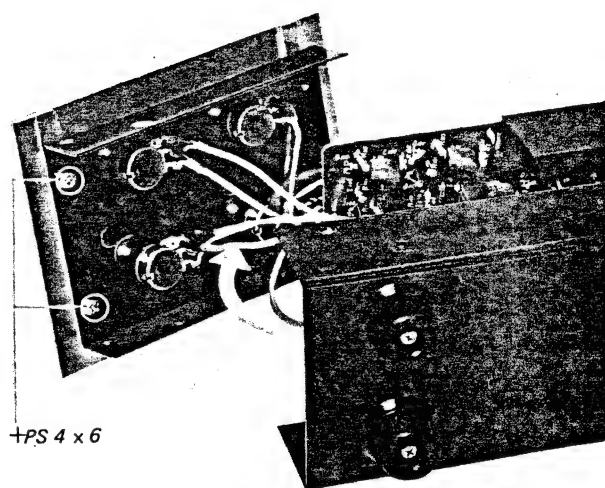


Fig. 2-4 Front panel removal

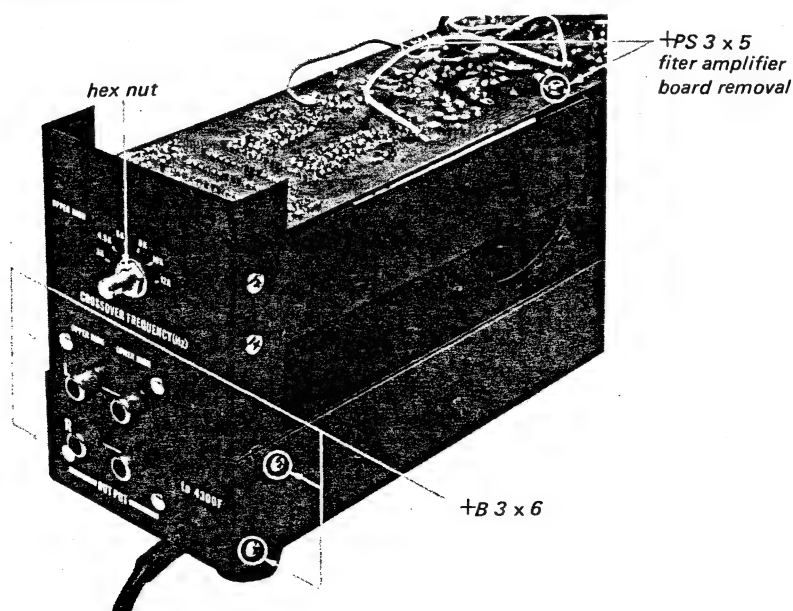


Fig. 2-5 Filter amplifier board and rear panel removal

2-5. CONTROL AND SWITCH REPLACEMENT

Prepare for replacing any of the controls by removing the top cover

LEVEL Controls

1. Remove the front panel as described in Procedure 2-3.
2. Remove the hex nut securing the defective controls to the front subchassis.
3. Unsolder the lead wires from the defective control, and then install the replacement control.

CROSSOVER FREQUENCY Switch

1. Remove the filter amplifier board as described in Procedure 2-4.
2. With a soldering-iron having a solder-sucking tip, clean the solder from each lug of the defective switch and the printed circuit board. This frees the switch.
3. Install the replacement switch.

2-6. REAR PANEL REMOVAL

1. Remove the top cover as described in Procedure 2-3.
2. Remove the filter amplifier board as described in Procedure 2-4.
3. Remove the two self-tapping screws (+B 3 X 6) at each side of the rear panel as shown in Fig. 2-5. This frees the rear panel.

2-7. REPLACEMENT OF COMPONENTS SECURED TO THE REAR PANEL BY RIVETS

1. Remove the rear panel as described in Procedure 2-6.
2. Bore out the rivets using a drill bit slightly larger in diameter than the rivet. See Fig. 2-6.
3. Punch out the remainder of the rivets with a nail set-or prick punch.
4. Remove the defective component, and then install a new one.
5. Secure the new component with suitable screws and nuts, or repair rivet screws (part number 3-701-402).

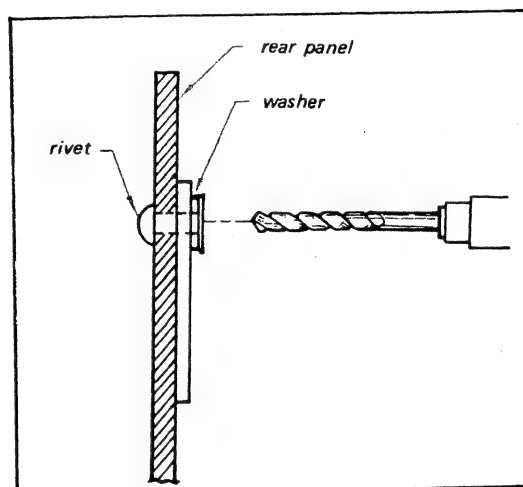


Fig. 2-6 Rivet replacement

TA-4300F
TAD-43F

SECTION 3

OVERALL CHECKS AND MEASUREMENTS

3-1. TEST EQUIPMENT REQUIRED

1. Audio Oscillator

Frequency range 10 Hz to 100 kHz
Distortion 0.03% or less at
1 kHz

2. Distortion Meter

Capable of measuring of 0.015% distortion or
less at 1 kHz.

Frequency range 20 Hz to 100 kHz
Input impedance 1 megohm or more.

3. Ac VTVM

Capable of measuring rms voltage of 0.5 mV
or less within a frequency range from 10 Hz
to 100 kHz.

Input impedance 500 k ohms or more

4. Attenuator

Capable of attenuating signals 60 dB or more.

Characteristic impedance . . . 600 ohms
unbalanced

5. Oscilloscope

Bandwidth 1 MHz or more

Note: 0 dB = 0.775 V (rms)

6. TA-4300F

3-2. LEVEL CHECK WITHIN PASSBAND

Preparation

Set the TA-4300F's controls and switches as
follows:

Channel Selector switch 4 CH
CROSSOVER FREQUENCY switch
HIGH S3 1.5 kHz
LOW S4 150 Hz

Procedure

With the equipment connected as shown in Fig.
3-1, check the output level according to the
procedures given in Table 3-1.

3-3. LEVEL CHECK AT CROSSOVER FREQUENCY

Preparation

1. Set the TA-4300F's switches and controls
as described in Procedure 3-2.

2. Calibrate the upper and lower output levels as
follows:

(a) With the equipment connected as shown
in Fig. 3-1, set the CROSSOVER
FREQUENCY selector switch to 12 kHz.
Feed a 5 kHz, 2 dB signal to the INPUT
jacks of the TA-4300F, and then adjust
the LOWER HIGH LEVEL controls to
obtain 0 dB readings at the LOWER HIGH
OUTPUT jacks.

TABLE 3-1. LEVEL CHECK WITHIN PASSBAND

OUTPUT Jacks	CROSSOVER FRE- QUENCY Selector Switch S1	Input Signal Level and Frequency	Output Level
LOWER HIGH	12 kHz	5 kHz, 0 dB	-1 ±0.5 dB
UPPER HIGH	3 kHz	20 kHz, 0 dB	-1 ±0.5 dB

Note: Set the TAD-43F's LEVEL control fully clockwise.

3-6. HARMONIC DISTORTION MEASUREMENT

Preparation

1. Set the TA-4300F's crossover frequency as described in Procedure 3-2.
2. Set the TAD-43F's LEVEL controls fully clockwise.

Procedure

1. With the equipment connected as shown in Fig. 3-4, feed a signal as specified in Table 3-4, to obtain a 14.2 dB (4.0 V rms) output.
2. Follow the procedures given in Table 3-4.

TABLE 3-2 CROSSTALK MEASUREMENT

OUTPUT Jack	CROSSOVER FREQUENCY selector Switch	Input Signal Frequency	Channel Crosstalk
LOWER HIGH	12 kHz	5 kHz	43 dB or more
UPPER HIGH	3 kHz	20 kHz	40 dB or more

TABLE 3-3 NOISE LEVEL MEASUREMENT

OUTPUT Jack	CROSSOVER FREQUENCY Selector Switch	Noise Level (With the TA-4300F's INPUT Jacks shorted)
LOWER HIGH	12 kHz	-80 dB or less
UPPER HIGH	3 kHz	-80 dB or less

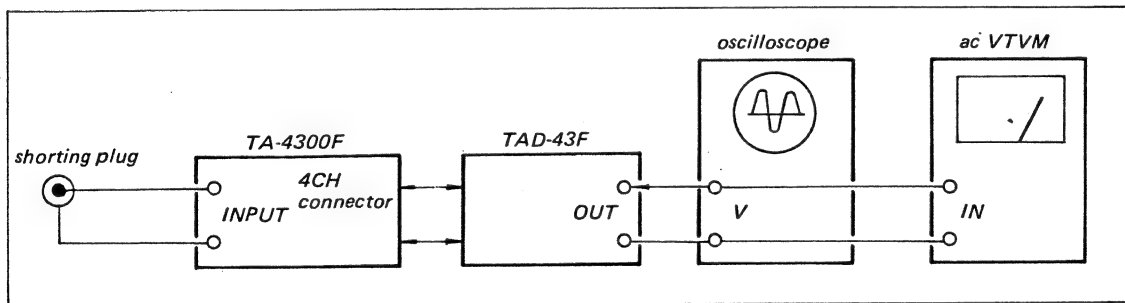


Fig. 3-3 Noise level check test setup

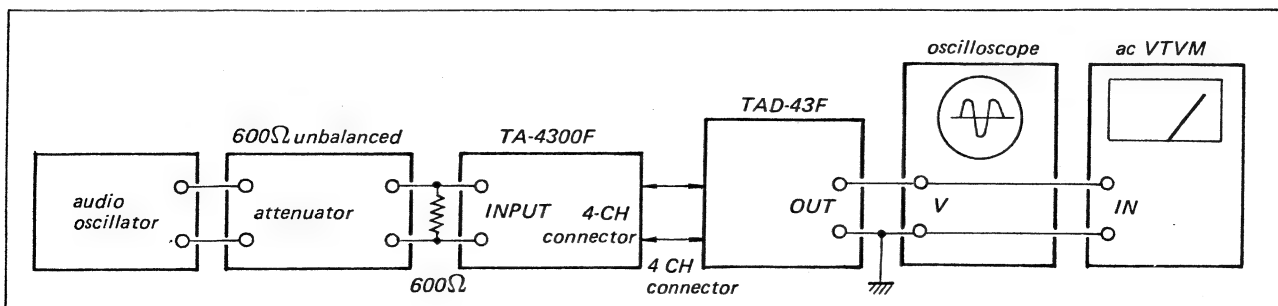


Fig. 3-4 Harmonic distortion test setup

TABLE 3-4 HARMONIC DISTORTION MEASUREMENT

OUTPUT Jacks	CROSSOVER FREQUENCY Selector Switch	Input Signal Frequency	Harmonic Distortion
LOWER HIGH	12 kHz	5 kHz	0.1% or less
UPPER HIGH	3 kHz	20 kHz	0.1% or less

SECTION 4 REPACKING

The TAD-43F's original shipping carton and packing material are the ideal containers for shipping the unit. However, to secure the maximum protection the

TAD-43F must be repacked in these materials precisely as before. The proper repacking procedure is shown in Fig. 4-1.

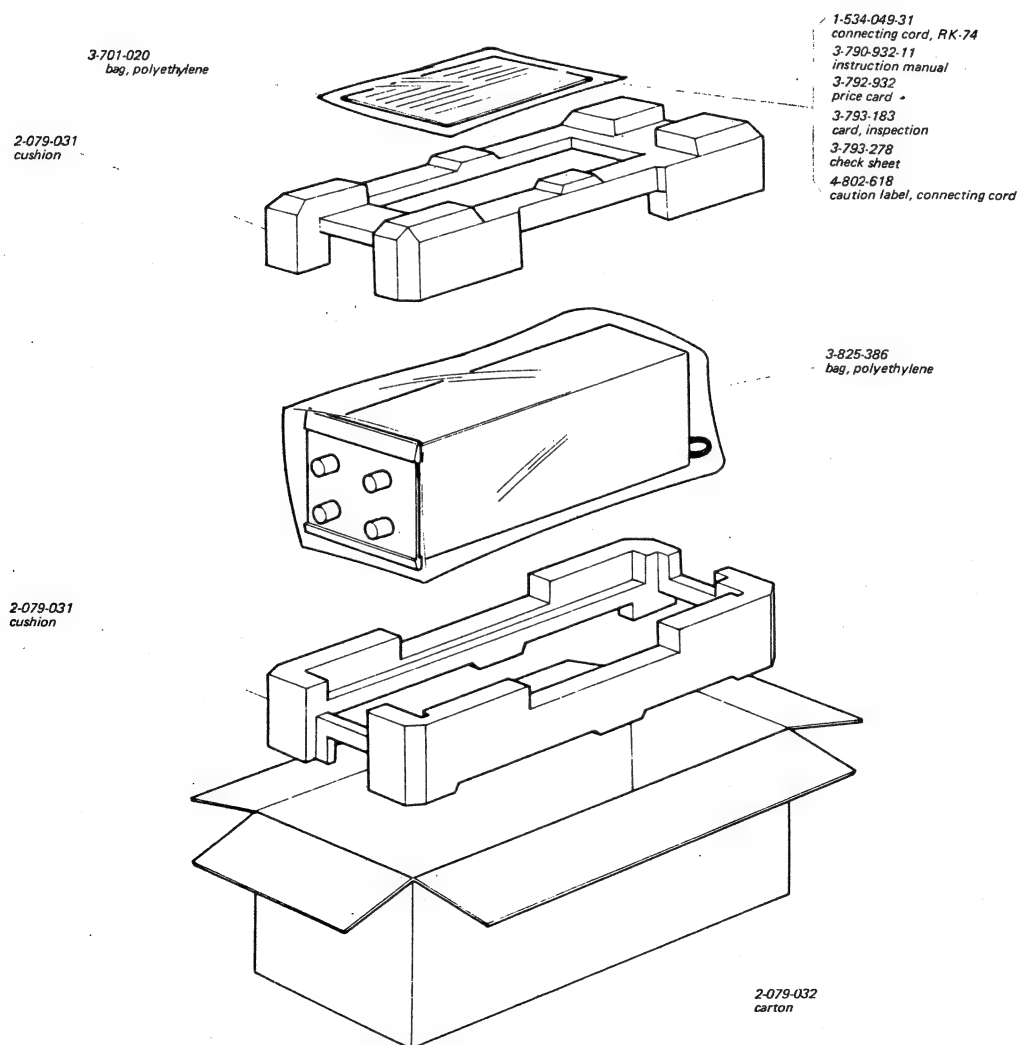
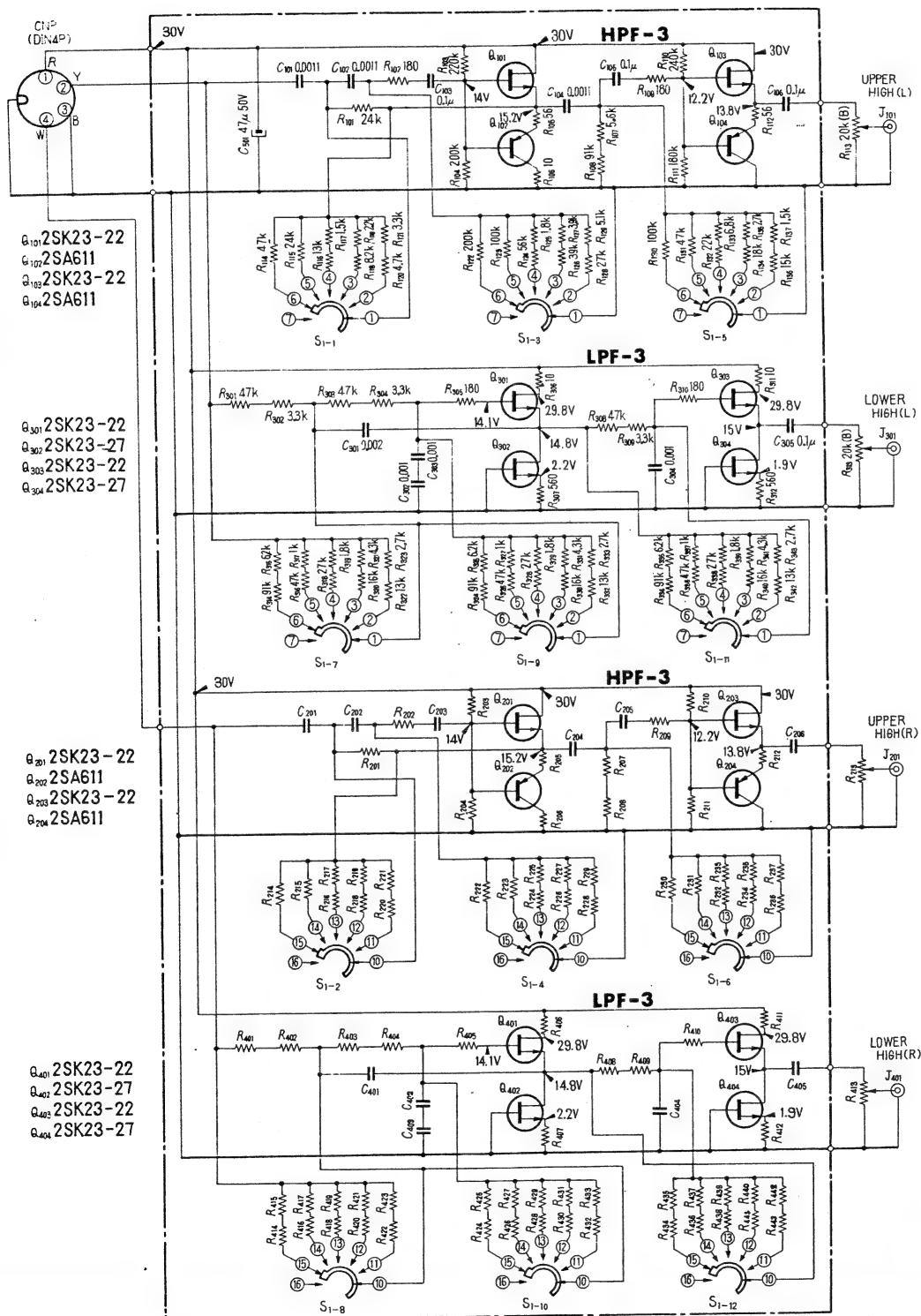


Fig. 4-1 Repacking

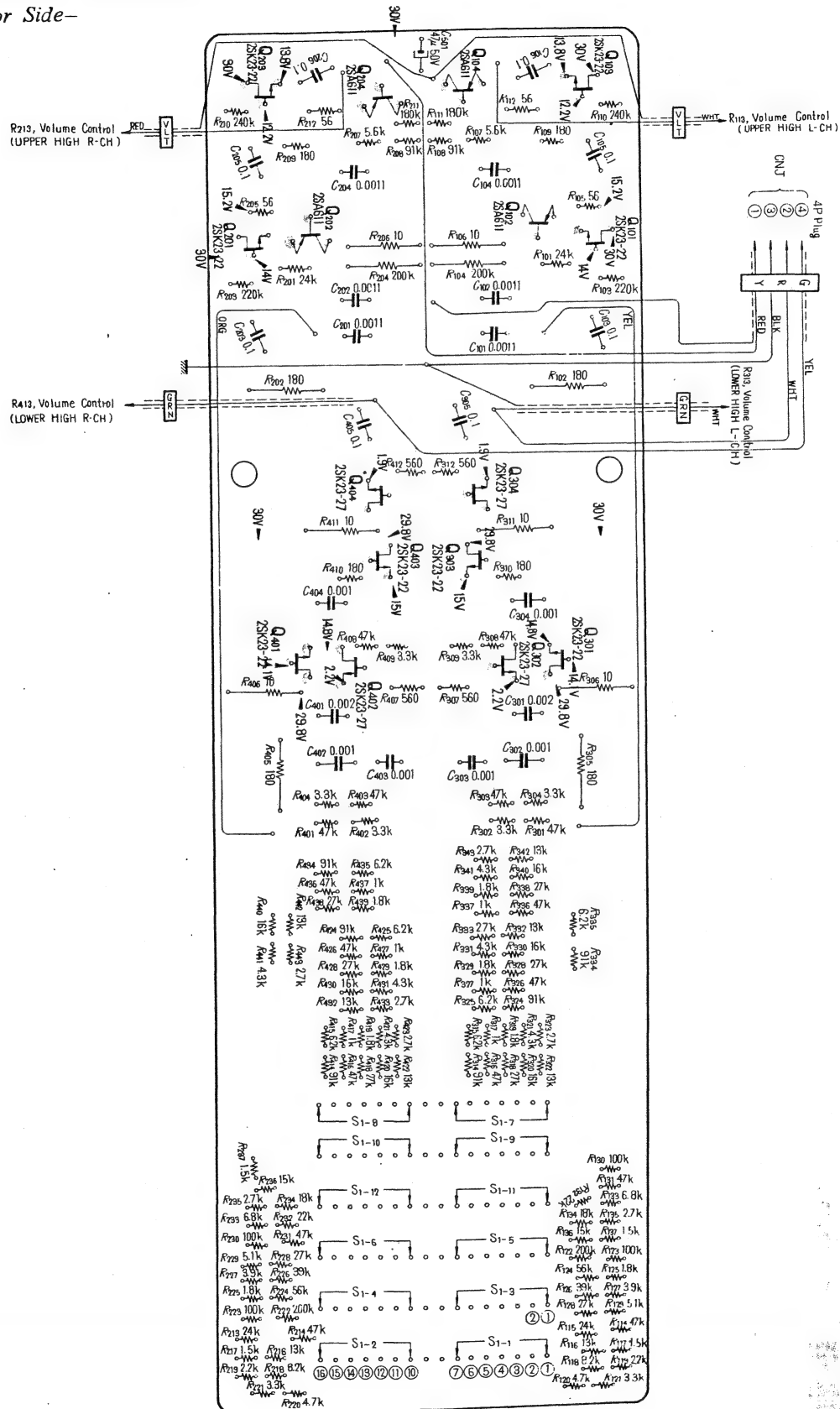
SECTION 5 DIAGRAMS

5-1. SCHEMATIC DIAGRAM

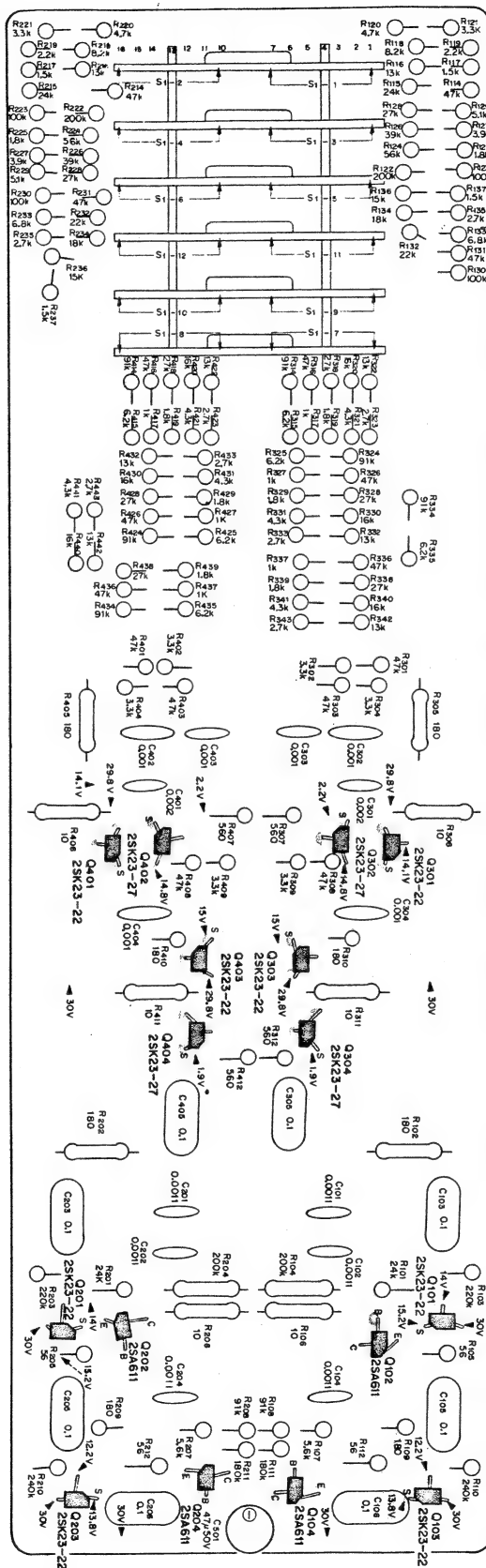


5-2. MOUNTING DIAGRAM.

—Conductor Side—

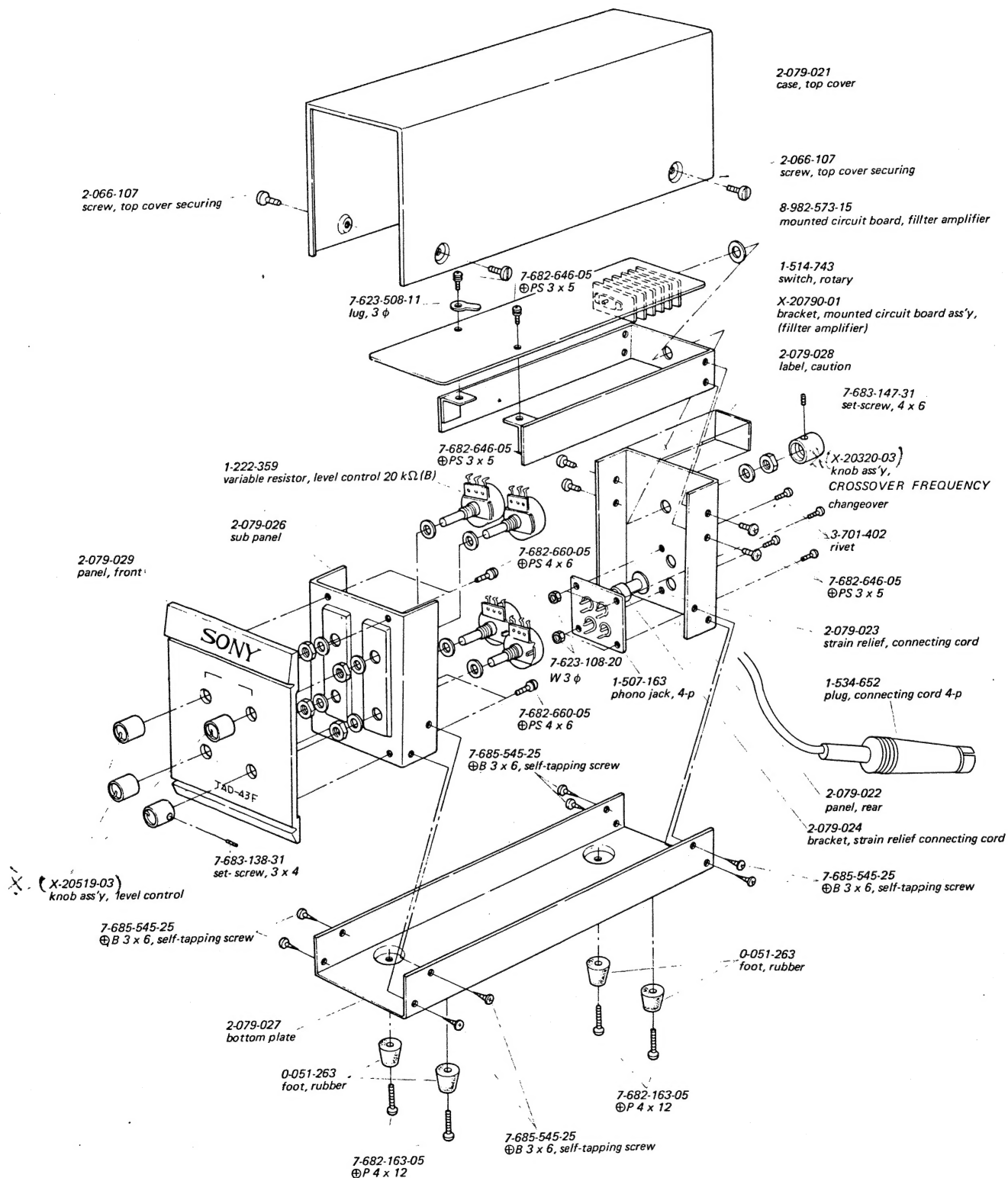


–Component Side–



SECTION 6

EXPLODED VIEW



SECTION 7

ELECTRICAL PARTS LIST

Ref. No. Part No. Description

Mounted Circuit Board

8-982-573-15 mainamplifier circuit board

Semiconductors

Q101(Q201)	FET,	2SK23-22
Q102(Q202)	transistor,	2SA611
Q103(Q203)	FET,	2SK23-22
Q104(Q204)	transistor,	2SA611
Q301(Q401)	FET,	2SK23-22
Q302(Q402)	FET,	2SK23-26
Q303(Q403)	FET,	2SK23-22
Q304(Q404)	FET,	2SK23-26

Capacitors

All capacitance values are in μF except as indicated with p, which means

C101(C201)	1-106-002-12	0.0011 $\pm 5\%$ 50V	mylar
C102(C202)	1-106-002-12	0.0011 $\pm 5\%$ 50V	mylar
C103(C203)	1-105-685-12	0.1 $\pm 10\%$ 50V	mylar
C104(C204)	1-106-002-12	0.0011 $\pm 5\%$ 50V	mylar
C105(C205)	1-105-685-12	0.1 $\pm 10\%$ 50V	mylar
C106(C206)	1-105-685-12	0.1 $\pm 10\%$ 50V	mylar
C301(C401)	1-106-008-12	0.002 $\pm 5\%$ 50V	mylar
C302(C402)	1-106-001-12	0.001 $\pm 5\%$ 50V	mylar
C303(C403)	1-106-001-12	0.001 $\pm 5\%$ 50V	mylar
C304(C404)	1-106-001-12	0.001 $\pm 5\%$ 50V	mylar
C305(C405)	1-105-685-12	0.1 $\pm 10\%$ 50V	mylar
C501	1-121-411	47 $\pm 100-10\%$ 50V	electrolytic

Resistors

All resistance values are in Ω , $\pm 5\%$, 1/4 W and carbon type unless otherwise indicated.

R101(R201)	1-242-706	24K
R102(R202)	1-244-655	180
R103(R203)	1-242-729	220K
R104(R204)	1-244-728	200K
R105(R205)	1-242-643	56
R106(R206)	1-244-625	10
R107(R207)	1-242-691	5.6K
R108(R208)	1-242-720	91K
R109(R209)	1-242-655	180
R110(R210)	1-242-730	240K

Ref. No. Part No. Description

R111(R211)	1-242-727	180K
R112(R212)	1-242-643	56
R113(R213)	1-222-359	20K (B) variable
R114(R214)	1-242-713	47K
R115(R215)	1-242-706	24K
R116(R216)	1-242-700	13K
R117(R217)	1-242-677	1.5K
R118(R218)	1-242-695	8.2K
R119(R219)	1-242-681	2.2K
R120(R220)	1-242-689	4.7K
R121(R221)	1-242-685	3.3K
R122(R222)	1-242-728	200K
R123(R223)	1-242-721	100K
R124(R224)	1-242-715	56K
R125(R225)	1-242-679	1.8K
R126(R226)	1-242-711	39K
R127(R227)	1-242-687	3.9K
R128(R228)	1-242-708	27K
R129(R229)	1-242-690	5.1K
R130(R230)	1-242-721	100K
R131(R231)	1-242-713	47K
R132(R232)	1-242-705	22K
R133(R233)	1-242-693	6.8K
R134(R234)	1-242-703	18K
R135(R235)	1-242-683	2.7K
R136(R236)	1-242-701	15K
R137(R237)	1-242-677	1.5K
R301(R401)	1-242-713	47K
R302(R402)	1-242-685	3.3K
R303(R403)	1-242-713	47K
R304(R404)	1-242-685	3.3K
R305(R405)	1-244-655	180
R306(R406)	1-244-625	10
R307(R407)	1-242-667	560
R308(R408)	1-242-713	47K
R309(R409)	1-242-685	3.3K
R310(R410)	1-242-655	180
R311(R411)	1-244-625	10
R312(R412)	1-242-667	560
R313(R413)	1-222-359	20K (B) variable
R314(R414)	1-242-720	91K
R315(R415)	1-242-692	6.2K
R316(R416)	1-242-713	47K
R317(R417)	1-242-673	1K
R318(R418)	1-242-707	27K
R319(R419)	1-242-679	1.8K
R320(R420)	1-242-702	16K
R321(R421)	1-242-688	4.3K
R322(R422)	1-242-700	13K

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
R323(R423)	1-242-683	2.7K
R324(R424)	1-242-720	91K
R325(R425)	1-242-692	6.2K
R326(R426)	1-242-713	47K
R327(R427)	1-242-673	1K
R328(R428)	1-242-707	27K
R329(R429)	1-242-679	1.8K
R330(R430)	1-242-702	16K
R331(R431)	1-242-688	4.3K
R332(R432)	1-242-700	13K
R333(R433)	1-242-683	2.7K
R334(R434)	1-242-720	91K
R335(R435)	1-242-691	6.2K

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
R336(R436)	1-242-713	47K
R337(R437)	1-242-673	1K
R338(R438)	1-242-707	27K
R339(R439)	1-242-679	1.8K
R340(R440)	1-242-702	16K
R341(R441)	1-242-688	4.3K
R342(R442)	1-242-700	13K
R343(R443)	1-242-683	2.7K

Miscellaneous

1-507-163	phono jack, 4-p
1-534-652	connecting cord

SONY CORPORATION

SONY

TA-4300F
TAD-43F

General Export Model

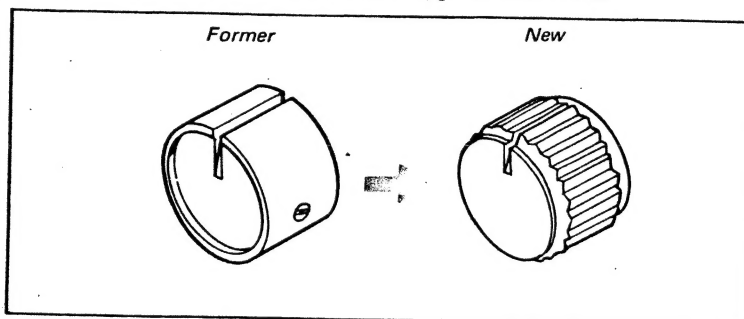
SERVICE MANUAL SUPPLEMENT

No. 1
July, 1971

Subject: Knob Change on Model TA-4300F and TAD-43F

1. INTRODUCTION

SONY has changed the design of knobs equipped in TA-4300F and TAD-43F as given in Table below. Note that the new knob is a serrated type as illustrated.



2. APPLICABLE SERIAL NUMBERS

Model	For General Export Model
TA-4300F	500,201 and later
TAD-43F	500,021 and later

3. INTERCHANGEABILITY

New and old knobs are not interchangeable.

TABLE 1 PARTS CHANGED

Model	Description	Part Number	
		Former	New
TA-4300F	LOW CHANNEL FREQUENCY SHIFT SW, BASS BOOST SW knobs CROSSOVER FREQUENCY (HIGH, LOW) SW knobs	X-20320-03	X-48049-05
	LEVEL control knobs (HIGH, MID-RANGE, LOW)	X-20519-03	X-48066-11
TAD-43F	LEVEL control knobs (LOWER HIGH, UPPER HIGH)	X-20519-03	X-48066-11
	CROSSOVER FREQUENCY SW knob	X-20320-03	X-48049-05

SONY CORPORATION